Vol. 999 Number 4

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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October 28, 1980

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DEPARTMENT
OF COMMERCE

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and
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
June 17, 1980. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of September 1980

Affirmed	158
Affirmed in part	30
Reversed	60
Total	248

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,783,202, Re. S.N. 171,849, Filed Jul. 24, 1980, Cl. 179/111 R, SPEAKER SYSTEM AND ELECTROSTATIC SPEAKER, Lloyd J. Bobb, Owner of Record: *Chester C. Pond, Doylestown, Pa.,* Attorney or Agent: Kenneth P. Synnestvedt, Ex. Gp.: 235

3,988,446, Re. S.N. 164,448, Filed Jun. 30, 1980, Cl. 424/230, GLYCERIDES WITH ANTI-INFLAMMATORY PROPERTIES, Gerard Yvon Paris, et al., Owner of Record: *Abbott Laboratories, North Chicago, Ill.,* Attorney or Agent: Paul D. Burgauer, et al., Ex. Gp.: 125

4,080,542, Re. S.N. 114,821, Filed Jan. 24, 1980, Cl. 310/159, HIGH DENSITY FLUX MAGNETIC CIRCUIT, Albert L. De Graffenried, Owner of Record: *Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.,* Attorney or Agent: George B. Finnegan, Jr., et al., Ex. Gp.: 212

4,103,056, Re. S.N. 171,756, Filed Jul. 24, 1980, Cl. 428/142, RESILIENT WOOD REPLICATION, Eugene L. Baratto, Owner of Record: *Minnesota Mining and Manufacturing Company, St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 164

4,104,675, Re. S.N. 172,058, Filed Jul. 25, 1980, Cl. 357/54, MODERATE FIELD HOLE AND ELECTRON INJECTION FROM ONE INTERFACE OF MIM OR MIS STRUCTURES, Donelli J. Di Maria, Owner of Record: *International Business Machine Corporation, Armonk, N.Y.,* Attorney or Agent: Hansel L. McGee, Ex. Gp.: 254

4,202,181, Re. S.N. 185,536, Filed Aug. 29, 1980, Cl. 62/141, FUEL CONSERVATION CONTROLLER FOR HEATING AND REFRIGERATION APPARATUS, Jeffrey W. Lamb, Owner of Record: *J & C Lamb Corporation, Long Island City, N.Y.,* Attorney or Agent: Myron Cohen, et al., Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Oct. 28, 1980

Re. 30,325	4,191,086	4,206,054	4,213,176
D. 255,115	4,191,420	4,206,132	4,213,333
3,696,935	4,191,638	4,206,295	4,213,345
3,821,248	4,191,772	4,206,321	4,213,412
3,867,026	4,192,041	4,206,369	4,213,477
3,989,049	4,192,318	4,206,676	4,213,499
4,045,381	4,192,576	4,206,827	4,213,737
4,052,529	4,192,754	4,206,966	4,213,866
4,055,808	4,193,097	4,207,033	4,213,985
4,056,691	4,193,139	4,207,132	4,214,011
4,058,996	4,193,149	4,207,195	4,214,015
4,067,889	4,193,527	4,207,363	4,214,332
4,083,735	4,193,555	4,207,693	4,214,417
4,094,359	4,193,921	4,207,739	4,214,461
4,097,412	4,194,550	4,207,773	4,214,492
4,101,407	4,195,864	4,207,895	4,214,726
4,109,728	4,196,386	4,207,956	4,214,738
4,115,404	4,197,225	4,208,241	4,214,766
4,121,692	4,197,651	4,208,252	4,214,779
4,121,715	4,197,888	4,208,631	4,214,908
4,130,231	4,198,105	4,208,666	4,214,916
4,144,027	4,198,159	4,208,769	4,214,931
4,147,078	4,198,235	4,209,036	4,214,950
4,149,129	4,198,410	4,209,047	4,215,017
4,153,116	4,198,737	4,209,223	4,215,057
4,154,946	4,198,845	4,209,426	4,215,212
4,157,793	4,199,367	4,209,493	4,215,317
4,158,859	4,199,491	4,209,540	4,215,594
4,162,197	4,199,588	4,209,601	4,215,741
4,162,849	4,199,679	4,209,602	4,216,041
4,163,407	4,199,821	4,209,788	4,216,090
4,163,843	4,200,054	4,209,809	4,216,236
4,163,900	4,200,858	4,209,996	4,216,318
4,175,828	4,201,126	4,210,054	4,216,320
4,176,717	4,201,163	4,210,056	4,216,335
4,179,600	4,201,240	4,210,138	4,216,394
4,180,647	4,201,271	4,210,281	4,216,583
4,181,346	4,201,378	4,210,514	4,216,679
4,181,602	4,201,569	4,210,708	4,216,684
4,182,662	4,201,780	4,210,734	4,216,771
4,183,127	4,201,830	4,210,757	4,216,829
4,183,620	4,202,542	4,210,818	4,216,985
4,183,922	4,202,823	4,210,982	4,217,061
4,184,196	4,202,914	4,211,089	4,217,076
4,184,376	4,202,951	4,211,292	4,217,142
4,184,924	4,203,444	4,211,294	4,217,255
4,185,132	4,203,875	4,211,395	4,217,291
4,185,275	4,203,935	4,211,472	4,217,304
4,185,508	4,204,002	4,211,595	4,217,327
4,185,564	4,204,153	4,211,741	4,217,412
4,186,593	4,204,226	4,212,045	4,217,459
4,187,115	4,204,728	4,212,123	4,217,572
4,187,511	4,204,922	4,212,184	4,217,739
4,187,543	4,204,969	4,212,196	4,217,747
4,188,284	4,205,166	4,212,310	4,218,211
4,188,459	4,205,264	4,212,385	4,218,267
4,188,466	4,205,327	4,212,427	4,218,316
4,188,736	4,205,420	4,212,464	4,219,358
4,189,758	4,205,458	4,212,962	4,219,495
4,190,053	4,205,516	4,212,978	4,219,595
4,190,522	4,205,655	4,213,082	4,219,876

Disclaimer

3,977,440.—*Larry R. Phillippi*, Mantua, Ohio. COMPOSITE BRAKE HOSE. Patent dated Aug. 31, 1976. Disclaimer filed Aug. 6, 1979, by the assignee, *Eaton Corporation*.

Hereby enters this disclaimer to claims 2 and 3 of said patent.

Dedications

3,858,527.—*Louise Lake*, New York, N.Y. and *George H. Mortimer*, Upper Montclair, N.J. WRIST ATTACHMENT AND MANUAL CONTROL FOR MOTOR VEHICLES. Patent dated Dec. 19, 1967. Dedication filed July 28, 1980, by the assignee, *Louise Lake Enterprises, Inc.*

Hereby dedicates to the Public th entire term of said patent.

3,373,628.—*Louise Lake*, New York, N.Y. and *George H. Mortimer*, Montclair, N.J. HAND CONTROL FOR MOTOR VEHICLES. Patent dated Mar. 19, 1968. Dedication filed July 28, 1980, by the assignee, *Louise Lake Enterprises, Inc.*

Hereby dedicates to the Public the entire term of said patent.

3,472,094.—*Louise Lake*, Palo Alto, Calif. and *George H. Mortimer*, Montclair, N.J. HAND CONTROL FOR MOTOR VEHICLES. Patent dated Oct. 14, 1969. Dedication filed July 28, 1980, by the assignee, *Louise Lake Enterprises, Inc.*

Hereby dedicates to the Public the entire term of said patent.

4,118,044.—*Harry Celms*, Battle Creek, Mich. GATE MECHANISM FOR CART. Patent dated Oct. 3, 1978. Dedication filed Aug. 18, 1980, by the assignee, *Roblin Industries, Inc.*

Hereby dedicates to the Public the entire term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6-085,180. An Electronic Sensor for Vapor-Pressure Deficit of the Air. Filed Oct. 15, 1979.

Patent application 6–132,584. Partial Argentation Resin Chromatography for Separation of Polyunsaturated Fatty Esters. Filed Mar. 21, 1980.

Patent application 6–132,596. Tool for Welding Plastics. Filed Mar. 21, 1980.

Patent application 6–134,008. Control of Parasitic Ticks. Filed Mar. 26, 1980.

Patent application 6–139,385. Preferential Epoxidation of Allyl Fatty Esters. Filed Apr. 11, 1980.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 6–014,179. Process for Preparation of Potassium-38. Filed Feb. 22, 1979.

Patent application 6–026,505. Metal-Doped Organic Foam and Method of Making Same. Filed Apr. 3, 1979.

Patent application 6–026,509. Instantaneous Radioiodination of Rose Bengal at Room Temperature and a Cold-Kit Therefor. Filed Apr. 3, 1979.

Patent 4,164,146. Apparatus and Method for Monitoring the Presence of a Conductive Media. Filed Nov. 2, 1976. Patented Aug. 14, 1979. Not available NTIS.

Patent 4,176,285. Electrical Pulse Generator. Filed Jan. 11, 1978. Patented Nov. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent 4,206,160. Mechanical Device to Produce a Finely Dispersed Aerosol. Filed Sept. 25, 1978. Patented June 3, 1980. Not available NTIS.

Patent 4,202,890. 4-Carboxy-Phthalato (1,2-Diaminocyclohexane)-Platinum(II) and Alkali Metal Salts Thereof With Cyclophosphamide and Hydroxyurea in Alleviating L1210 Murine Leukemia. Filed Dec. 22, 1978. Patented May 13, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–134,833. Portable Personnel Platform and Ladder. Filed Mar. 8 1980.

Patent application 6–137,037. A Linearized Multiplier Device for Triple Product Convolvers. Filed Mar. 4, 1980.

Patent application 6–142,281. Personnel Chain Climber. Filed Apr. 21, 1980.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–145,282. Constant Magnification Optical Tracking System. Filed Apr. 30, 1980.

Patent application 6–147,700. Adjustable High Emittance Gap Filler. Filed May 7, 1980.

Patent 4,195,512. Coal-Shale Interface Detector. Filed Nov. 3, 1977. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,840. Method and Apparatus for Holding Two Separate Metal Pieces Together for Welding. Filed Apr. 6, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,197,530. Passive Intrusion Detection System. Filed Feb. 9, 1977. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,198,209. Process for the Leaching of AP From Propellant. Filed Sept. 29, 1978. Patented Apr. 15, 1980. Not available NTIS.

Patent 4,198,232. Preparation of Monotectic Alloys Having a Controlled Microstructure by Directional Solidification Under Dopant-Induced Interface Breakdown. Filed Dec. 29, 1978. Patented Apr. 15, 1980. Not available NTIS.

Patent 4,198,788. Method of Forming a Sharp Edge on an Optical Device. Filed July 28, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,198,988. Pulse Transducer With Artifact Signal Attenuator. Filed July 26, 1978. Patented Apr. 22, 1980. Not available NTIS.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
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	Sunnyvale: Patent Information Clearinghouse*	(408) 738–5580
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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Michigan	Detroit Public Library	(313) 833-1458
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	St. Louis Public Library	(314) 241-2288 Ext. 214
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New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides: Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director Receptacles; Be arings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 704), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents..... Numbers 2,277 to 2,286, inclusive

REISSUES

OCTOBER 28, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,423

VARIABLE SPEED WINCH

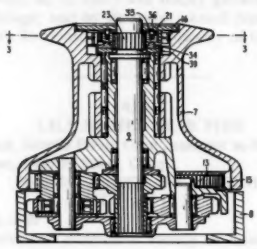
Albert J. Hutton, Baulkham Hills; Allen W. Hutton, Burwood, and Richard J. Dellit, Granville, all of Australia, assignors to Barlow Marine Limited, Australia

Original No. 3,962,935, dated Jun. 15, 1976, Ser. No. 522,123, Nov. 8, 1974. Application for reissue Jun. 13, 1978, Ser. No. 915,008

Claims priority, application Australia, Nov. 12, 1973, 5622/73

Int. Cl.[2] F16H *5/52*; B66D *1/30*

U.S. Cl. 254—346 **4 Claims**



1. A winch comprising, in combination, a unidirectional drum rotatable *in one sense of rotation only* initially by the [clockwise motion] *rotation* of a handle in a [clockwise] *first* sense [only], and a gear selector comprising a control [plate] *member* rotatable with respect to said drum into [an extreme clockwise] *a first* position wherein a first gear ratio is selected[, whereby subsequent clockwise] *in which* rotation of said handle *in said first sense* gives the drum a [clockwise] *rotational* speed equal to that of the handle, and wherein subsequent [anti-clockwise] rotation of said handle *in a second sense opposite to said first sense* causes said drum to continue [clockwise] rotation [at] *in said one sense via* an intermediate [higher speed with reference to the handle, up to a point where said] *gear ratio selected by this reversal of the sense of rotation of the handle to obtain rotation of the handle in said second sense, said rotation of the handle in the second sense enabling said* control [plate is] *member to be* urged into [an extreme anti-clockwise] *a second* position with respect to said drum to select a second gear ratio *for rotation of said handle in the first sense,* whereupon *after selection of said second gear ratio* the reversal of the handle [and] *with* subsequent [clockwise] rotation thereof *in said first sense* causes continued [clockwise] rotation of said drum [at a still higher speed with reference to said handle] *in said one sense via said second gear ratio* and wherein *a subsequent* reversal of said handle [and subsequent] *with* further [anti-clockwise] rotation [thereof] *in said second sense* causes said drum to revert to *rotation via* said intermediate [higher speed] *gear ratio* whilst continuing to rotate [clockwise] *in said one sense,* said gear selector further comprises ratchet means [splined to a shaft rotatable by said handle,] whereby [clockwise motion] *rotation* of said handle [operates a gear train] *in said first sense directly drives said drum* in said first gear ratio, via said shaft but whereby [anti-clockwise motion] *rotation* of said handle [operates said gear train] *in said second sense drives said drum* in said [second] *intermediate* gear ratio via [said shaft] *a gear train;*

said ratchet means being slidable [axially] with respect to said shaft under the influence of cam means responsive to [the relative angular displacement] *rotation* of said handle [with respect to said control plate] *in said second sense,*

said control [plate] *member* has [recesses] *first entrainment means* engageable by [respective spring loaded balls captively] *second entrainment means* supported by [said] ratchet means, [and said balls are] *one of said first and second entrainment means is* adapted to [enter and lock within said recesses] *entrain the other of said first and second entrainment means* in response to [an anti-clockwise] rotation of said handle *in said second sense* sufficient to cause [axial] sliding of said ratchet means[,] with respect to said shaft[,] under the influence of said cam means whereby said control [plate] *member* is urged [anti-clockwise until] *towards said second position in which* said gear train assumes said second gear ratio.

REISSUES

OCTOBER 28, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

Re. 30,4[illegible]

VARIABLE SPEED WINCH

Albert J. Hutton, Baulkham Hills; Allan W. Hutton, Burwood, and Richard L. Hollis, Granville, all of Australia, assignors to Barlow Marine Limited, Australia

Original No. 4,002,537, dated Jan. 11, 1977, Ser. No. 522,123, Nov. 8, 1974. Application for reissue Jan. 11, 1979, Ser. No. [illegible]

Claims priority, application Australia, Nov. 12, 1973, 5632/73

Int. Cl.[3] B66D 1/30

U.S. Cl. [illegible] [illegible] Claims

PLANT PATENTS

GRANTED OCTOBER 28, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,603

LILY NAMED CRIMSON SUN

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Jul. 30, 1979, Ser. No. 62,412
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybird lily plant substantially as herein shown and described, characterized by the color, form and stacked-head arrangement of its red-orange flowers; by its short and stocky growth habit and its abundant foliage; and by its rapid asexual reproductive rate and its ability for consistently high quality of forcing as a pot plant.

4,604

LILY NAMED STAR FIRE

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Jul. 30, 1979, Ser. No. 62,413
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by the color, form and arrangement of its brilliant red flowers and by its short and stocky growth habit and abundant foliage.

4,605

LILY PLANT NAMED STAR DUSTER

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Jul. 30, 1979, Ser. No. 62,315
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Asiatic hybrid lily, substantially as herein shown and described, characterized by the form and color of its bright orange-red and speckled flowers, by its relatively short and stocky growth habit, and by its extremely quick and consistently high quality of forcing for cut flower and pot plant production.

4,606

LILY PLANT NAMED GOLD DUST

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Jul. 30, 1979, Ser. No. 62,316
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Asiatic hybrid lily plant, substantially as herein shown and described, characterized by generally yellow-orange appearing blooms of medium size having golden yellow stripes extending the length of each petal, on each side of a central furrow, over an orange-red background.

PATENTS

GRANTED OCT. 28, 1980

ERRATA

For CLASS	See PATENT NO.
052–588	4,229,844
005–127	4,229,845
368–282	4,229,936
474–082	4,229,987
474–028	4,229,988
474–012	4,229,989
175–297	4,230,197
430–159	4,230,492
152–209 R	4,230,512
156–315	4,230,613
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528–206	4,230,817
528–272	4,230,818
528–483	4,230,819
036–001	4,230,888
370–024	4,230,903
370–071	4,230,910
370–084	4,230,911
375–004	4,230,989
455–067	4,230,990
343–005 NQ	4,231,005

PATENTS

GRANTED OCT. 28, 1980

SUBJECTS

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3225–3231	4,229,936
3232–3238	4,229,937
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3267–3273	4,229,942
3274–3280	4,229,943
3281–3287	4,229,944
3288–3294	4,229,945
3295–3301	4,229,946
3302–3308	4,229,947
3309–3315	4,229,948
3316–3322	4,229,949
3323–3329	4,229,950
3330–3336	4,229,951
3337–3343	4,229,952
3344–3350	4,229,953
3351–3357	4,229,954
3358–3364	4,229,955
3365–3371	4,229,956
3372–3378	4,229,957
3379–3385	4,229,958
3386–3392	4,229,959
3393–3399	4,229,960
3400–3406	4,229,961
3407–3413	4,229,962
3414–3420	4,229,963
3421–3427	4,229,964
3428–3434	4,229,965
3435–3441	4,229,966
3442–3448	4,229,967
3449–3455	4,229,968
3456–3462	4,229,969
3463–3469	4,229,970
3470–3476	4,229,971
3477–3483	4,229,972
3484–3490	4,229,973
3491–3497	4,229,974
3498–3504	4,229,975
3505–3511	4,229,976
3512–3518	4,229,977
3519–3525	4,229,978
3526–3532	4,229,979
3533–3539	4,229,980
3540–3546	4,229,981
3547–3553	4,229,982
3554–3560	4,229,983
3561–3567	4,229,984
3568–3574	4,229,985
3575–3581	4,229,986
3582–3588	4,229,987
3589–3595	4,229,988
3596–3602	4,229,989
3603–3609	4,229,990
3610–3616	4,229,991
3617–3623	4,229,992
3624–3630	4,229,993
3631–3637	4,229,994
3638–3644	4,229,995
3645–3651	4,229,996
3652–3658	4,229,997
3659–3665	4,229,998
3666–3672	4,229,999
3673–3679	4,230,000
3680–3686	4,230,001
3687–3693	4,230,002
3694–3700	4,230,003
3701–3707	4,230,004
3708–3714	4,230,005
3715–3721	4,230,006
3722–3728	4,230,007

PATENTS

GRANTED OCTOBER 28, 1980

GENERAL AND MECHANICAL

4,229,832

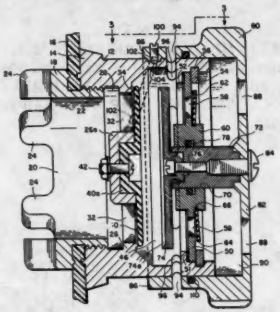
DIVER'S SUIT EXCESS GAS EXHAUST VALVE

Charles H. Dickson, Sr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 21, 1979, Ser. No. 41,037

Int. Cl.[3] A62B *17/00*

U.S. Cl. 2—2.1 R **12 Claims**



1. A valve for controlling venting of air from a diver's suit of the type wherein a thermally insulating layer of air is maintained in the body portion of the suit, said valve comprising:

a substantially hollow valve body having defined therein a first cavity in communication with said layer of air in said suit;

a second cavity defined in said valve body;

a first interior wall extending transversely of said valve body between said first and second cavities, said wall having first means for flow of air from said first cavity to said second cavity;

a resiliently flexible first check valve element, cooperative with said first passage means, for permitting fluid flow from said first cavity to said second cavity and for preventing fluid flow from said second cavity to said first cavity;

a second interior wall extending transversely of said valve body in spaced relation to said first interior wall with said second cavity therebetween, said second interior wall having second passage means for flow of air from said second cavity;

a second check valve element, cooperative with said second passage means, for permitting fluid flow from said second cavity through said second passage means to an ambient fluid zone and for preventing fluid flow into said second cavity through said second passage means; and

a sealing plate disposed between said first and second interior walls and movable into and out of confining relation with said first check valve element, whereby when in said confining relation said first check valve seals said first passage means against fluid flow therethrough into or out of said first cavity.

9. A diver's suit exhaust valve comprising:

a valve body;

an inlet cavity defined in said valve body and adapted to communicate with the interior of a diver's suit;

first and second valve elements housed in spaced, series relation in said body;

a first outlet cavity defined in said valve body between said first and second check valve elements;

first outlet port means defined in said body for communication between said first outlet cavity and the exterior of said body;

a knob member mounted on said valve body for movement between at least first and second operative positions and through an intermediate position, said knob member defining with said valve body a second outlet cavity;

second outlet port means defined in said knob member for communication between said second outlet cavity and the exterior of said valve;

third outlet port means defined in said knob member and movable into and out of registration with said first outlet port means in accordance with said first and second operative positions of said knob member; and

a check valve sealing member disposed in said first oulet cavity and movable into and out of confining relation with said first check valve element in response to movement of said knob member between said first and second operative positions.

4,229,833

WARM-UP SLEEVE

William J. Cox, Rte. 1, and James A. Hagale, Box 394, both of Ozark, Mo.

Filed Aug. 16, 1978, Ser. No. 934,181

Int. Cl.[2] A41D *13/08*

U.S. Cl. 2—16 **8 Claims**

1. A warm-up sleeve, adapted to be worn on one arm of a wearer, said warm-up sleeve comprising:

a body portion arranged to cover at least a portion of said arm, said body portion being of a generally cylindrical shape and having a wrist opening at the lower edge thereof;

a peripherally stretchable cuff portion attached to said body portion lower edge for snugly engaging the lower edge of said body portion against the wrist or lower arm of said wearer;

a shoulder covering portion arranged to cover at least a portion of the shoulder corresponding with said arm, said shoulder covering portion being defined by an outer edge and first and second lateral edges, said shoulder covering portion being integrally formed with said body portion to define, in conjunction with a shirred underarm edge of said body portion, an upper arm opening;

elastic means attached to said underarm edge for holding the shoulder covering portion tightly against the wearer; and

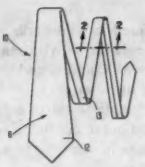
a resilient holding strap having one end attached to said first lateral edge and the other end attached to said second lateral edge adapted to loop under and to rest against the underarm area of the other arm of the wearer;

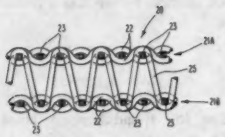
thereby providing a warm-up sleeve for the wearer's arm which may be securely retained in place and which may conform to and tightly engage the wearer's body in the vicinity of his shoulder and wrist.

4,229,834
NECKWEAR CONSTRUCTION

Norman R. Alexander, Chappaqua, N.Y., and Harold F. Sutton, Albemarle, N.C., assignors to Ack-Ti-Lining, Inc., New York, N.Y.

Filed Feb. 8, 1979, Ser. No. 10,376
Int. Cl.[3] A41D 25/06
U.S. Cl. 2—146 5 Claims



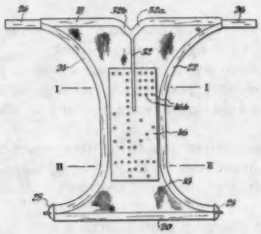


1. Neckwear having a light-weight single interwoven double cloth fabric which has excellent resiliency and improved hand, stretching, and knotting characteristics, comprising:
a fabric casing folded longitudinally;
a single interwoven double cloth fabric within said fabric casing having two superimposed layers of plain woven fabric and a binder thread alternatively engaging each of said two superimposed layers.

4,229,835
PADDED UNDERGARMENT FOR PHYSICAL FITNESS

Joy D. Shaw, 3444 Spring Bluffs Pl., Lauderhill, Fla. 33319

Filed Nov. 17, 1978, Ser. No. 961,664
Int. Cl.[2] A41B 9/00
U.S. Cl. 2—406 1 Claim

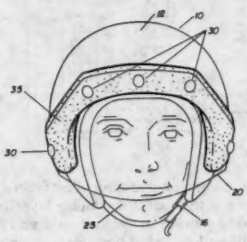


1. A lightweight undergarment for providing both padded protection in the crotch area of the wearer and lifting support of the buttocks, comprising:
a stretchable, flexible resilient panel consisting of a fabric or fabric like material, said panel having a longitudinal axis and a first end to be disposed in the front waist area of the wearer and a second end representing the rear waist area of the wearer, said panel having a lateral mid portion substantially narrower than the lateral ends, said lateral mid portion being sized to be received in the crotch area of the wearer;
first and second elastic bands being connected to the sides of said panel, said first and second elastic bands forming first and second leg-encompassing straps;
a third elastic band connected along the edge of the front panel end forming a front elastic waist band;
a fourth elastic band connected along the rear end portion of said panel, said rearly fastened elastic band including a centrally disposed Y-shaped elastic band, a portion of which is connected along the longitudinal axis from the rear waist band toward the central portion of said panel terminating in the crotch area of the panel;
a resilient pad disposed substantially in the crotch area of the wearer connected to said panel; and
a plurality of fasteners connected at the ends of said first, second, third and fourth elastic bands for fastening the front waist band to the rear waist band, said resilient pad being disposed along the longitudinal axis of the panel and overlapping the crotch and buttocks area of the wearer.

4,229,836
FACE SHIELD/HELMET AIRFLOW NOISE REDUCER

William Stinger, 6906 Virginia Ave., St. Louis, Mo. 63111

Filed Mar. 7, 1979, Ser. No. 18,459
Int. Cl.[3] A42B 3/00; A61F 9/04; A42B 1/24
U.S. Cl. 2—422 4 Claims

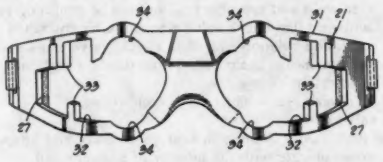


1. A device constructed of flexible, compressible material, that can be affixed between a standard crash helmet, as worn by motorcycle riders, and a standard transparent face shield that is fixedly attached thereto by releasable fasteners, said device having holes formed therein through which the releasable fasteners extend thus enabling the device to be readily removable from said helmet and said face shield upon separation of said fasteners whereby said device stops wind flow between the top and sides of the face shield and where it attaches to the helmet, and so greatly reduces noise and irritating wind turbulence.

4,229,837
SAFETY GOGGLES

Ray L. Solari, 1670 Cordova St., Los Angeles, Calif. 90007

Filed Apr. 25, 1977, Ser. No. 790,479
Int. Cl.[2] A61F 9/02
U.S. Cl. 2—431 3 Claims



1. Safety goggles for a sport using a ball, the goggles having a frame adapted for fitting receipt onto the face of a wearer and closely spaced therefrom, and including upper and lower frame parts defining an elongated generally horizontally extending opening opposite each eye of a vertical dimension at least equal to that of the eye pupil throughout its horizontal length, comprising:

each horizontally extending opening defined by the frame parts including a vertical extension directly in front of each eye, said horizontally extending openings and vertical extensions thereof being free of centrally located obstructions; and

the upper and lower frame parts having a plurality of mutually spaced members integral with said frame parts and extending a limited extent into each horizontally extending opening outwardly of the vertical extension, said spaced members having their ends lying within the first and second openings spaced from one another;

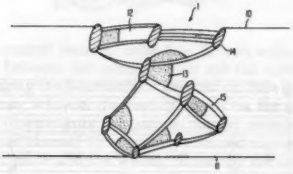
each said horizontally extending opening and vertical extension thereof presenting a maximum circular open space less than the circular dimensions of said game ball.

4,229,838

VASCULAR PROSTHESIS HAVING A COMPOSITE STRUCTURE

Hiroshi Mano, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 3, 1978, Ser. No. 921,680
Claims priority, application Japan, Jul. 1, 1977, 52/79385
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.4 **8 Claims**



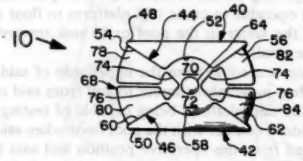
1. A vascular prosthesis having a composite structure of a porous tubing of polytetrafluoroethylene with polyethyleneimine in the pores of the tubing, said polyethyleneimine being water-insolubilized with the amino groups quaternized and having heparin ionically bound thereto.

4,229,839

JOINT PROSTHESIS

Leonard J. Schwemmer, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Nov. 16, 1977, Ser. No. 852,183
Int. Cl.³ A61F *1/03, 1/04, 1/08*
U.S. Cl. 3—1.91 **39 Claims**



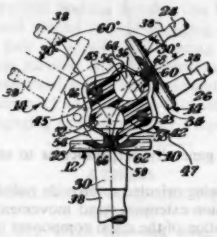
37. A prosthesis for replacing a skeletal joint in a human body comprising a first joint component adapted for connection with a first element, a second joint component adapted for connection with a second element, at least one of said first and second elements being a portion of a human body, a pivot component disposed between said first and second joint components, means for resiliently connecting said pivot component to said first and second joint components, said resilient means including a first body of elastomeric material disposed between and attached to said first joint component and said pivot component, a second body of elastomeric material disposed between and attached to said second joint component and said pivot component, said first and second bodies of elastomeric material being spaced apart and suspending said pivot component between said first and second joint components to permit motion of said first and second joint components relative to each other about said pivot component in simulating the operation of a skeletal joint in a human body.

4,229,840

TOTAL TRISPHERICAL WRIST PROSTHESIS

Anthony G. Gristina, Winston-Salem, N.C., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 1, 1978, Ser. No. 929,915
Int. Cl.³ A61F *1/03*
U.S. Cl. 3—1.91 **9 Claims**



1. A total trispherical prosthetic wrist device comprising a ball-headed radial component of a biocompatible metal, a radial stem on the ball-headed radial component for affixing it to the intramedullary canal of the distal radius, a radial flange separating the ball head of the radial component from its stem, a ball-headed metacarpel component of a biocompatible metal, a pair of metacarpel stems on the metacarpel component for affixing it to a pair of metacarpel bones of the hand, a metacarpel flange means separating the metacarpel ball from the metacarpel stems, a polygonal ball-capturing member having a pair of spherical sockets disposed substantially 180° from each other, the ball-capturing member comprising a pair of biocompatible cutout plastic hemipolygonal blocks sharing the sockets between them, clamping means joining the hemipolygonal bolcks together whereby the ball heads are rotatably trapped in the sockets to provide a substantially stable wrist prosthesis with substantially wide range of movement, the clamping means comprising a pair of metal elongated rectangular shells having longer sides and shorter ends with the ball heads extending through the shorter ends, the clamping means substantially surrounding the hemipolygonal blocks whereby the shells are spacially compatible within the wrist area and provide a range of motion in excess of normal, and fastening means joining the metal shells together.

4,229,841

WRIST PROSTHESIS

Youngil Youm, Beltsville, Md., and Adrian E. Flatt, Iowa City, Iowa, assignors to The University of Iowa Research Foundation, Iowa City, Iowa

Filed Nov. 17, 1978, Ser. No. 961,821
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.91 **14 Claims**

9. A wrist prosthesis comprising,

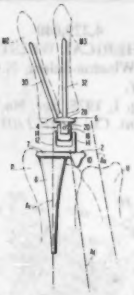
a proximal component, a distal component, and a joint member,

connector means for connecting the proximal component to the radius of the forearm,

a first pivot pin defining a first generally transverse pivot axis connected to said proximal component and said joint member to provide pivotal movement of the joint member about said first generally transverse pivot axis,

connector means for connecting the distal component to at least one of the metacarpal bones,

a second pivot pin defining a second generally transverse pivot axis connected to said distal component and said joint member to provide pivotal movement of said distal component about said second generally transverse pivot



axis which is generally perpendicular to said first pivot axis,

said pivot pins being oriented to provide radial-ulnar movement and flexion-extension hand movement and to prevent axial rotation of the distal component relative to the proximal component.

4,229,842

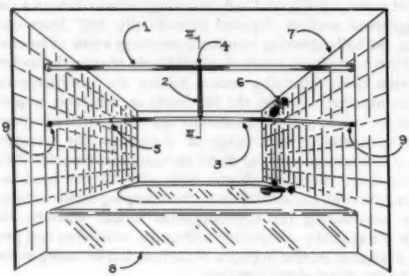
SHOWER CURTAIN CONVERTIBLE SUPPORT ADAPTER

Louis Gilmore, 245 E. 80th St., Suite 1C, New York, N.Y. 10021

Filed Apr. 20, 1979, Ser. No. 31,494

Int. Cl.³ A47K *3/22*

U.S. Cl. 4—610 **12 Claims**



1. A shower curtain adapter for expanding the shower space in a shower enclosure formed by first and second opposite facing vertical walls, a third vertical wall extending between said first and second walls and a shower curtain, said shower curtain being vertically hung from a straight standard curtain rod extending in a substantially horizontal plane between said first and second walls, said adapter comprising an adapter rod having a length greater than the distance between said first and second walls, said adapter rod being of flexible material so that when said adapter rod is mounted between said first and second walls it will flex as a result of the presence exerted between said first and second walls and will bow outwardly away from said third wall to engage said shower curtain, coupling means pivotally connected at one end thereof to said adapter rod and pivotally connected at the other end thereof to said standard curtain rod thereby preventing downward movement of said adapter rod when said adapter rod is pressure mounted between said first and second walls and said coupling means is connected to said standard curtain rod, whereby said adapter rod when mounted between said first and second walls will be positioned in a plane below and substantially parallel to said horizontal plane of said standard curtain rod and when unmounted can be hung by said coupling means in a storage position.

4,229,843

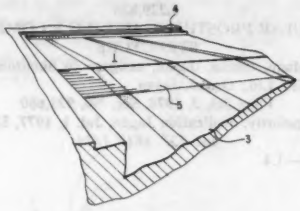
POOL FLOOR

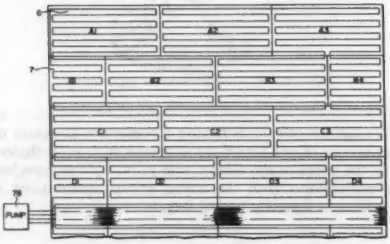
Germain Belanger, St. Germain de Grantham, Canada, assignor to Bombardier Limited, Quebec, Canada

Filed Jul. 18, 1978, Ser. No. 925,753

Int. Cl.³ E04H *3/16, 3/18*

U.S. Cl. 4—495 **15 Claims**





1. An adjustable flooring structure for a swimming pool comprising:

a planar platform having a flat upper side and a lower side;

a plurality of legs each engageable in an operative position with said platform to extend downwardly therefrom and to support said platform in a horizontal disposition at a predetermined height above the floor of a swimming pool;

buoyancy adjusting means mounted on said platform and selectively operable to cause said platform to float to the surface of the water in the pool or to sink towards the floor of the pool;

said legs being accessible from the upper side of said platform to effect movement thereof to and from said operative position, said platform being capable of resting with its lower side in contact with the pool floor when said legs are removed from the operative position and said buoyancy adjusting means operated to cause the platform to sink.

4,229,844

SWIMMING POOL COPING

James T. Cribben, Mechanicsburg, and Richard A. Feeser, Mt. Holly Springs, both of Pa., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 30, 1979, Ser. No. 34,862

Int. Cl.³ E04H *3/18*

U.S. Cl. 52—588 **9 Claims**

1. A swimming pool coping comprising an edge piece and a cover piece; said edge piece including a base plate for attach-

ment to a wall of a swimming pool, an intermediate member extending upwardly from the base plate for engaging a corresponding central member of the cover piece, a channel extending from one end of the base plate for receiving the edge of a swimming pool liner, a curved outer end extending from the upper wall of the channel and mating means extending from the upper part of the curved outer end for pivotally engaging mating means on the cover piece; said cover piece including a mating means on said cover piece for pivotally engaging the edge piece mating means, a member extending downwardly from the cover piece mating means for resting on the edge piece, a vertical member extending downwardly from the other end of the cover piece for resting on one edge of the base

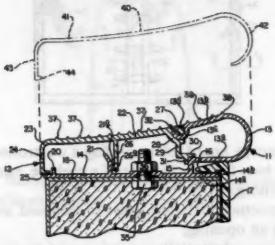


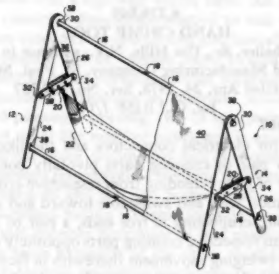
plate and a central member extending downwardly from the cover piece between the mating means and the vertical member for engaging the intermediate member on the base plate of the edge piece; wherein the mating means on the edge piece includes a downwardly extending curved member which forms a curved channel for receiving a beaded edge on one end of the cover piece and the mating means on the cover piece comprises a beaded edge for engaging the curved channel of the mating means of the edge piece and a curved member extending downwardly and outwardly from the mating means of the cover piece below the beaded edge which forms a channel with the beaded edge for receiving the downwardly extending curved member of the mating means on the edge piece.

4,229,845

COLLAPSIBLE HAMMOCK SUPPORT

Graciela V. O. de Cuadros, 9 de Octubre 836 (4to Piso), Guayaquil, Ecuador

Filed Sep. 7, 1978, Ser. No. 940,288
Int. Cl.[2] A45F 1/00
U.S. Cl. 5—127 **9 Claims**



1. A collapsible hammock support comprising:

(a) first and second ground-engaging support members for supporting a hammock at either end, said first and second ground-engaging support members each comprising an A-shaped structure comprising first and second legs which are pivotably connected together and a transverse bracing member which is pivotably connected to said first leg and which is detachably connected to said second leg, whereby said transverse bracing member can be detached from said second leg and said second leg can be pivoted into alignment with said first leg in order to collapse each of said first and second ground engaging support members from a first, or use, position to a second, or travel, position;

(b) three pairs of longitudinal bracing members, each longitudinal bracing member in each pair being connected to the other longitudinal bracing member in that pair by first means normally permitting relative pivotal motion between the two bracing members but permitting the user to selectively rigidify the two bracing members into a single rigid element, one pair of longitudinal bracing members being detachably connected to said A-shaped structures at the top of the A and at the bottom of each leg, whereby said longitudinal bracing member can be detached from said first and second ground-engaging support members and each pair of longitudinal bracing members can be pivoted into parallel, or travel, position; and

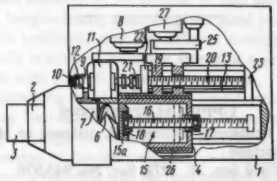
(c) second and third means for detachably connecting one end of a hammock to adjacent side of said first and second ground-engaging support member, respectively.

4,229,846

WATER-SAVING FLOAT-TO-INLET VALVE ADAPTER DEVICE

Edgar English, Jr., 45125 Redwood Ave., Lancaster, Calif. 93534

Filed Aug. 27, 1979, Ser. No. 69,832
Int. Cl.[3] E03D 1/35
U.S. Cl. 4—396 **12 Claims**



1. A water-saving float-to-inlet valve adapter device for modifying the refilling level of a toilet flush tank of a type which includes a source of water under pressure and an inlet valve provided with an operating member for connecting same to an interior chamber within a toilet flush tank and which also includes a buoyant float member adapted to be connected to the inlet valve for opening same whenever the float member drops below a predetermined level and for closing same whenever the float member rises to at least substantially the same predetermined level, comprising: a replacement adapter having a first end adapted to be attached to an inlet valve opening and closing operating member and having a downwardly displaced second end remote from said first end and adapted to be attached to a buoyant toilet tank float member at a level substantially below that of the normal attachment location of such a toilet tank buoyant float member, whereby to effectively relatively downwardly displace the normal vertical position of such a hollow buoyant float member which corresponds to the closing of such an inlet valve and thus causes a toilet flush tank to refill only partially to a lower level than has been the customary practice with a conventional attachment arm adapted to conventionally substantially transversely interconnect such a buoyant float member and such an inlet valve operating member, said effective downward displacement of said second end of said replacement adapter relative to said first end thereof being provided by an intermediate down-

wardly offset displacement portion of said adapter effectively displacing the entire second end correspondingly downwardly from the entire first end thereof by an amount determined by the magnitude of said intermediate downwardly offset displacement portion, said intermediate downwardly offset displacement portion of said replacement adapter being further provided with manual adjustment means and thereby being controllably manually adjustable whereby to correspondingly modify the normal valve closing position of a buoyant float member adapted to be attached to the second end thereof and to similarly correspondingly modify the normal water refilling level within a toilet flush tank, said manual adjustment means comprising two relatively vertically slideably engageable adjustment portions and locking means for controllably locking same in any relatively vertically adjusted position; and water volume selector and indicator means effectively cooperable with respect to a portion of said replacement adapter carrying said second end and perceptibly indicating a selected extent of said magnitude of the vertical displacement of said second end relative to said first end and correspondingly perceptibly indicating a selected modified vertical position which a buoyant float member adapted to be attached to said second end will assume when in a normal valve closing position and thus correspondingly indicating a selected modified normal water refilling level within a toilet flush tank, said water volume selector and indicator means being effectively interconnected by said two relatively vertical slideably engageable adjustment portions of said manual adjustment means and including scale means and relatively moveable index means cooperable with said scale means for providing a perceptible indication of said relative vertical adjustment of said two vertically slideably engageable adjustment portions.

4,229,847

UPPER MATTRESSES

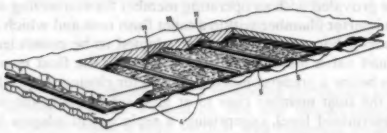
Hugo Degen, Seltisberg, Switzerland, assignor to Marpal AG, Chur, Switzerland

Filed Sep. 26, 1978, Ser. No. 945,970

Claims priority, application Switzerland, Sep. 27, 1977, 11784/77

Int. Cl.[2] A47C *27/15, 27/22*

U.S. Cl. 5—481 **11 Claims**



10. A mattress comprising:

(a) a foam substance member having a longitudinal axis and a plurality of cavities formed therein,

(b) each cavity having a longitudinal axis and being defined by a boundary wall extending between an apex, and a laterally spaced horizontal plane with at least one horizontal support shoulder intermediately located between said apex and said horizontal plane,

(c) each cavity extending transversely to the longitudinal axis of said foam substance member,

(d) said at least one horizontal shoulder being effective to cause the resilient reaction force of said foam substance member adjacent each said cavity to initially rise continuously with increasing loading on said mattress.

4,229,848

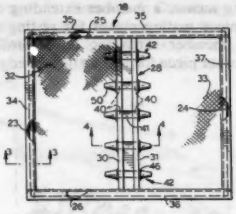
BEE ESCAPE BOARD

Valadimir Shaparew, 3371 Trafalgar Rd. R.R.#1, Oakville, Ontario, Canada

Filed Jan. 18, 1979, Ser. No. 961

Int. Cl.[3] A01K *47/06*

U.S. Cl. 6—4 B **9 Claims**



1. A bee escape board for providing a controlled migratory pathway for bees from a chamber of a beehive, said bee escape board comprising:

a frame structure including pairs of opposed side members defining an opening;

screen means substantially covering said frame opening of said frame structure and secured thereto; said screen means preventing migration of bees from a first side of said escape board to a second side thereof, while simultaneously permitting passage of air therethrough;

a distribution disposed within said frame structure and supported between a pair of opposed side members adjacent the screen means whereby said screen provides a transverse opening for bees to enter said distribution members, said distribution member having a longitudinal channel therein communicating with a plurality of through holes provided in said distribution member perpendicular to said channel to provide a migratory pathway for bees through the escape board; and

bee escape cells of hollow frustoconical shape secured to said distribution member at each said through hole in said distribution member and projecting therefrom so as to permit voluntary migration of bees therefrom, while substantially preventing their return in the reverse direction; each said escape cell including a first ingress opening and a second egress opening smaller than said ingress opening at a distance spaced therefrom.

4,229,849

HAND CRIMP TOOL

Werner C. Theiler, Sr., Dix Hills, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

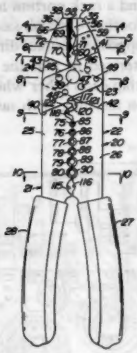
Filed Apr. 24, 1978, Ser. No. 899,337

Int. Cl.[3] B25F *1/00*

U.S. Cl. 7—107 **4 Claims**

1. A tool for electrical connectors and the like, said tool comprising a pair of crossing parts pivotally connected together, a pair of jaws extending from respective crossing parts in facing relation with and swingable toward and away from each other and terminating at free ends, a pair of lever arms extending from respective crossing parts oppositely away from said jaws for swinging movement therewith in facing relation with each other, handgrips extending from the distal ends of said lever arms, and a single pair only by convergent entirely planar surfaces on the facing region of each of said jaws and tapering toward each other, the converging planar surfaces of one jaw converging at one location to intersect with each other in a generally straight cutting edge, the converging planar surfaces of the other jaw converging at a facing location to respective intersections with opposite sides of a generally flat truncated surface defining an anvil for said cutting edge

and limiting swinging movement of said crossing parts, jaws and lever arms, said pair of converging planar surfaces of each



jaw at other facing locations converging to arcuately concave truncated surfaces defining crimping edges.

4,229,850

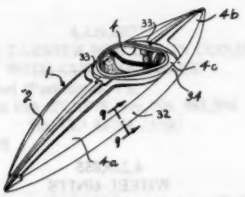
KAYAK

Pierre Arcouette, 39 rue Montagne Apt. 21, Granby, Quebec, Canada

Continuation-in-part of Ser. No. 830,814, Sep. 6, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 922,071

Int. Cl.³ B63B *35/00*

U.S. Cl. 9—1.4 **17 Claims**



14. A kayak comprising an integrally molded one piece elongated hull of semi-rigid material and defining a bottom wall, side walls and a top wall which latter has a passenger opening of restricted dimensions relative to said top wall so that the latter extends fore and aft and also laterally from said passenger opening, and an internal frame structure to stiffen said hull, said structure including three separate parts each having dimensions permitting its insertion within said hull through said passenger opening, two of said parts being each an elongated panel-like member positioned in an upright central longitudinal plane within said hull fore and aft of said passenger opening respectively, extending between, contacting and conforming to said top and bottom walls, each of said panel-like members having a beam extension projecting from the end of said member proximate to said passenger opening towards the beam extension of the other panel-like member, both beam extensions extending longitudinally along said bottom wall, contacting and conforming to the same, the third separate part being a seat located within said hull below said passenger opening, having a U-shaped cross-section defining a lower central seating portion resting on said two beam extensions and a pair of upwardly directed side wings extending close to the respective side walls and having upper ends engaged underneath and contacting said top wall laterally of said passenger opening.

4,229,851

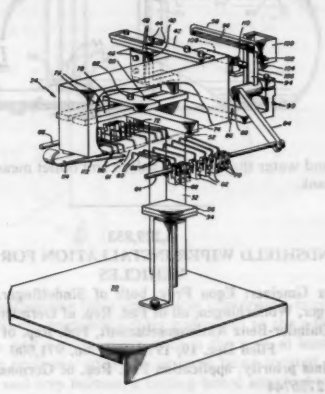
METHOD FOR STIFFENING SHOE INSOLES

Leo F. Stanton, Newburyport, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Division of Ser. No. 765,095, Feb. 3, 1977, Pat. No. 4,122,573. This application May 30, 1978, Ser. No. 910,150

Int. Cl.² A43D *0/00*

U.S. Cl. 12—146 S **8 Claims**



1. A method for forming and applying a shank stiffener to the bottom of a shoe insole, said stiffener initially being in the form of an elongate flexible sleeve containing a flexible matrix of externally activatable thermosetting resin, said method comprising:

placing said stiffener on the bottom of said insole;

engaging longitudinally extending marginal portions of the sleeve to resiliently urge the stiffener toward and against the insole bottom to hold the sleeve in a predetermined position with respect to the insole bottom;

while maintaining the sleeve in said predetermined position, exposing the sleeve to an external stimulus capable of passing through the sleeve and activating the resin to effect curing of the resin, said sleeve being constructed in a manner in which it will become initially limp and flacid when exposed to said external stimulus;

permitting the limp and flacid insole stiffener to fall against the insole bottom to conform fully to the contour of the insole while in said limp, flacid condition; and

continuing exposure of the sleeve to the external stimulus to effect curing of the resin in said insole-conforming configuration.

4,229,852

PORTABLE PIPE CLEANING APPARATUS

Glenn H. Brobeck, 193 Geneva Dr., Aliquippa, Pa. 15001

Filed Nov. 22, 1978, Ser. No. 963,165

Int. Cl.³ B08B *9/02*

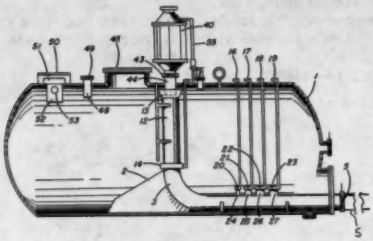
U.S. Cl. 15—3.5 **7 Claims**

1. An apparatus for cleaning pipes comprising:

(a) a tank capable of withstanding at least about 100 psi; and

(b) a plurality of outlet valve means in communication with said tank and with a single discharge outlet means, said

valves adapted to be opened independently of each other, said valves functioning to allow a variable discharge of air



and water through said valves and outlet means from said tank.

4,229,853

WINDSHIELD WIPER INSTALLATION FOR MOTOR VEHICLES

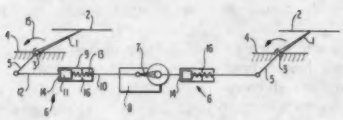
Günter Gmeiner; Egon Frey, both of Sindelfingen, and Josef Berger, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,000

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1977, 2756744

Int. Cl.³ B60S *1/02*

U.S. Cl. 15—250.16 **8 Claims**



1. A windshield wiper installation for motor vehicles, comprising wiper arm means having wiper blade means, drive means for the wiper arm and wiper blade means including a driving motor, linkage means and wiper shaft means, the wiper arm means together with the wiper blade means being operable to be parked inside of a well in the cowl of the body in front of the windshield, characterized in that the drive means for the wiper arm means are so constructed that the wiper arm means together with the wiper blade means are manually movable out of their parking position in the wiping direction through a predetermined angular path and subsequently are movable back into the parking position.

4,229,854

SOOT BLOWER CONSTRUCTION

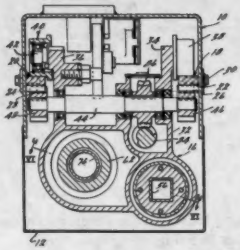
Jesse C. Johnston, Jr., Carroll, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 6, 1978, Ser. No. 949,089

Int. Cl.³ F23J *3/02*

U.S. Cl. 15—316 R **4 Claims**

1. In a long retracting soot blower or the like comprising a frame structure including a generally horizontal elongated support, a lance carried by the support for movement generally parallel thereto to and from positions in which an end of the lance projects differing distances beyond the end of the support, and combined means for so moving the lance and for transmitting vertical loadings from the lance to said support, said combined means including a carriage to which the lance is attached, the carriage being movably carried by the support to actuate the lance, said carriage having a rigid frame, a carriage driving pinion journaled in the carriage on a transverse axis, and a roller also journaled in the carriage frame on a transverse axis vertically displaced from the first mentioned transverse axis, said combined means also including a rigidly integrated longitudinal rack and track structure carried by the support including a track portion having a generally horizontal longitudinal track surface and a rack portion having a generally horizontal longitudinal toothed surface, said surfaces facing away from each other in opposite vertical directions, said combined means being characterized in that the track surface and the toothed surface overlap each other when viewed in a vertical projection, the pinion meshing with said toothed surface and



the roller being rollable on said track surface, and the axes of the roller and pinion being rigidly fixed in the carriage frame on parallel lines transverse to the longitudinal extent of said rack and track structure, the line of engagement of the roller directly overlying the position of meshing engagement between the pinion and toothed surface, whereby the rack and track structure is confined between the pinion and roller and vertical forces are transmitted in opposite directions via the carriage frame and the roller and pinion into the integrated rack and track structure.

4,229,855

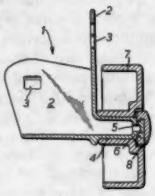
WHEEL UNITS

Anthony P. V. Rowe, 1, Royal Crescent, London W. 11, England

Filed Feb. 21, 1979, Ser. No. 13,285

Int. Cl.² B60B *33/00*

U.S. Cl. 16—29 **8 Claims**



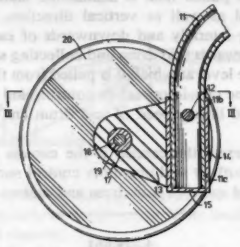
1. A toy wheel unit comprising a mounting member comprising three generally orthogonal parts defining a closed corner for receiving a closed corner of an article to be provided with a wheel, a stub shaft integral with said mounting member, a wheel rotatably mounted on said stub shaft, means for retaining said wheel on said stub shaft, and means for releasably fixing said mounting member to the article.

4,229,856

WHEEL SUPPORT ARRANGEMENTS

Curtis A. Sparkes, Altringham, England, assignor to Lamondine S.A., Fribourg, Switzerland

Filed Sep. 21, 1978, Ser. No. 944,665
Claims priority, application United Kingdom, Sep. 21, 1977, 39240/77
Int. Cl.[2] B60B 33/00
U.S. Cl. 16—47 11 Claims



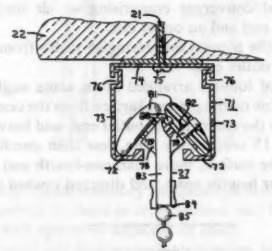
1. A wheel support arrangement for supporting a wheel axle in spaced relationship to a leg frame member, comprising an elastomeric element defining a wheel axle journal support portion at one end and a leg frame attachment saddle portion defining its other end spaced from said wheel axle support, said elastomeric element being arranged to permit resilient deflection of said wheel axle support along three axes relative to said leg frame attachment part.

4,229,857

DUAL WHEEL CARRIER FOR USE IN CONJUNCTION WITH CURTAIN TRACK

Ellis I. Toder, Fort Washington, Pa.

Filed Feb. 27, 1978, Ser. No. 881,394
Int. Cl.[3] A47H 15/00
U.S. Cl. 16—95 R 12 Claims



1. A dual wheel carrier for use in conjunction with an underlying carrier track consisting of a pair of parallel longitudinally extending spaced apart tracks, said carrier comprising in combination,

(a) an axles support from which extend divergingly upward a pair of axles, and from which depends means for attaching an item to be carried, and

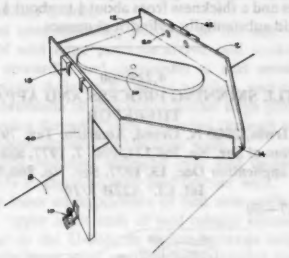
(b) a wheel mounted on each of said axles for rotation, the lowest points of said wheels being spaced apart the proper distance so that each wheel is seatable on and rideable along a different one of the spaced apart tracks of the aforesaid carrier track, said wheels converging toward one another at their upper edges.

4,229,858

BOAT-MOUNTABLE FISH-CLEANING TRAY

Stephen M. Baxter, P.O. Box 3995, Sarasota, Fla. 33578; M. David Baxter, 9 Northwood Dr., and James D. Eadline, P.O. Box 310, both of Vineland, N.J. 08360

Filed Nov. 1, 1978, Ser. No. 956,687
Int. Cl.[3] A22C 25/06
U.S. Cl. 17—44 2 Claims



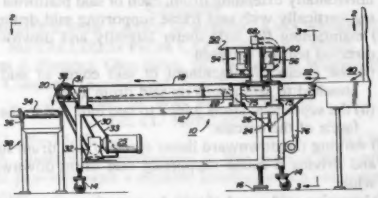
1. A boat-mountable fish-cleaning tray comprising, in combination, a bottom, upstanding sides connected to the edges of said bottom, and a drainage opening in the tray, at least one point on the perimeter of which opening being located on or adjacent to said tray bottom; a cutting board attached to said tray bottom; and a means for attaching the tray to a boat so that when attached the lowest points on the tray are adjacent to the aforementioned opening and so the part of the tray with said opening is suspended out away from the boat and over the water, said means for attaching the tray to a boat consisting of a plurality of legs which at their tops are slotted and connected to the tray by means of hand-tightenable and -loosenable fasteners which fit through the aforementioned slots, and which said legs at their bottoms can be cut to length to hold the tray at the proper working height and position and shaped to fit the contour of the boat at which points they are attached thereto, said legs being attachable to a boat by means of fittings, each comprising an L-shaped piece which is attached to the leg, a flat baseplate which is attached to the boat, and a hand-tightenable and -loosenable fastener which fits through a hole in the L-shape piece and screws into the baseplate.

4,229,859

MEAT PATTY PROCESSING METHOD AND APPARATUS

Eugene D. Gagliardi, Jr., West Chester, and Nicholas C. Gagliardi, Newtown Square, both of Pa., assignors to Gagliardi Bros., Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 744,587, Nov. 24, 1976, abandoned. This application May 1, 1978, Ser. No. 901,558
Int. Cl.[3] A22C 7/00
U.S. Cl. 17—45 13 Claims



1. An automated process for forming meat patties comprising the steps of:

(a) forming a plurality of substantially cylindrical masses of

ground meat, said masses being of substantially uniform weight;

(b) distributing said masses of ground meat on a continuously moving conveyor surface; and

(c) flattening said masses of ground meat between two moving surfaces, one of which is said continuously moving conveyor surface and the other of which is a substantially flat surface which reciprocates in a direction substantially perpendicular to the surface of said conveyor, to form substantially disk-shaped meat patties having irregular edges and a thickness from about ¼ to about ½ of the length of said substantially cylindrical masses.

4,229,860

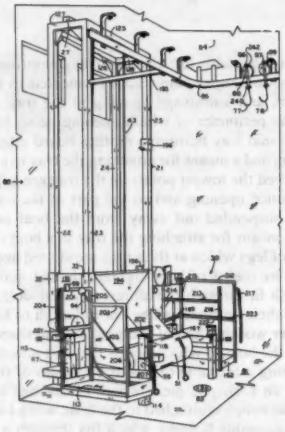
CATTLE SKINNING PROCESS AND APPARATUS THEREFOR

David C. Irwin, 2900 N. Grand, Amarillo, Tex. 79107

Continuation of Ser. No. 766,121, Feb. 7, 1977, abandoned. This application Dec. 13, 1977, Ser. No. 860,120

Int. Cl.³ A22B *5/16*

U.S. Cl. 17—50 **2 Claims**



2. Process of removing hide from an animal carcass also comprising, hide, hind legs and forelegs, said process comprising the steps of

(a) firmly supporting said carcass from its hind legs, with its hind legs above its forelegs and the spine of the animal substantially vertical, and attaching two laterally spaced edges of said hide to a horizontally elongated cylindrical drum therebelow at points on the surface of said drum further apart than the distance between said edges of said hide;

(b) and operators for cutting said hide from said carcass being each supported on both sides of said carcass on a platform extending forward of the forward edge of said horizontally extending drum, each of said platforms moving vertically with said frame supporting said drum;

(c) maintaining the hide under laterally and downwardly directed tension between

(i) the points of attachment of said edges of said hide attached to said points on said drum and

(ii) the superficial fascia joined to said hide and to the deep fascia of the carcass,

(d) varying the downward linear speed of said drum surface and driving a frame supporting said drum downwardly while

(e) lessening said speed of said drum surface when a greater force is required to pull said hide from the carcass and increasing said speed when less force is required to pull said hide; and

(f) automatically moving the carcass away from one side of the carcass whereat the tension on said pulled hide by said fascia is lesser and away from the operator on the platform on said one side of the carcass and towards another side of said carcass whereat the tension between the pulled hide and said fascia is greater and closer to the operator on said another side of said carcass;

(g) cutting said superficial fascia where the greatest tensile force exists between the hide and the deep fascia and pulling the hide from said carcass on both sides thereof while the pulled hide is maintained under tension in a horizontal as well as vertical direction, said direction extending laterally and downwards of each side of the carcass towards said drum and collecting said pulled hide below the level at which it is pulled from the carcass; and at least one of said operators controls and varies the said downward linear speed of said drum and motion of the frame;

(h) and wherein the carcass is the carcass of a cow and wherein both of said operators control and vary the said downward speed of said drum and motion of the frame.

4,229,861

MATERIAL CONVERGER

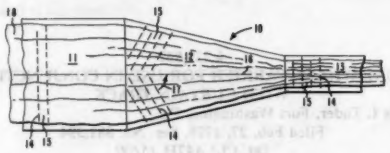
Edgar A. Campo, Circleville, Ohio, and Robert B. Lewis, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 808,994, Jun. 22, 1977, Pat. No. 4,144,618. This application Aug. 10, 1978, Ser. No. 932,633

The portion of the term of this patent subsequent to Mar. 30, 1996, has been disclaimed.

Int. Cl.² D04H *11/00;* **B65H** *17/32*

U.S. Cl. 19—161.1 **8 Claims**



1. A material converger comprising an air feed plenum having an inlet end and an outlet end,

a surface on the plenum decreasing in width from the inlet end to the outlet end,

a multitude of louvers arranged at an acute angle with a reference line on the plenum surface from the center of the inlet end to the center of the outlet end, said louvers being from 2 to 15 centimeters long, less than one-fourth the width of the surface, more than one-fourth and less than three louver lengths apart, and directed toward the outlet end.

4,229,862

STRAP TENSIONING BUCKLE

Axel R. Kubelka, Kirchstetterngasse 47, A 1160 Vienna, Austria, assignor to Erwin Weigl and Axel Kubelka, both of Vienna, Austria

Filed Feb. 21, 1978, Ser. No. 879,717

Claims priority, application Austria, Feb. 22, 1977, 1185/77

Int. Cl.² A43C *11/00*

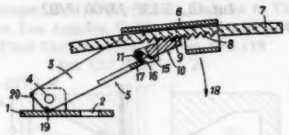
U.S. Cl. 24—68 SK **7 Claims**

1. A strap tensioning buckle for a straplike pull element on ski boots or the like, said buckle comprising a tensioning lever turnable into a tightening position and hinged for movement about a hinge axis onto an eye fixed with a base plate fixed on the boot or on an element connected to said boot, and further, comprising two arms adjacent to the hinge axis and distant

from each other by a clearance equal at least to the width of said pull element and allowing between them a passageway for said pull element, and furthermore comprising a clamping device for holding the pull element, said tensioning buckle being characterized in that

the tensioning lever in the portion opposite to the hinge axis is provided with a clamping lever and a cover plate covering said pull element,

that the clamping lever is pivotally mounted in the tensioning lever, its pivotal axis being substantially parallel to the



hinge axis of the tensioning lever, and its free end being directed opposite to the direction of the tensile load acting on the pull element,

that the length of the clamping lever is greater than the perpendicular distance between its pivotal axis and the lower surface of the cover plate, diminished by the thickness of the pull element, and

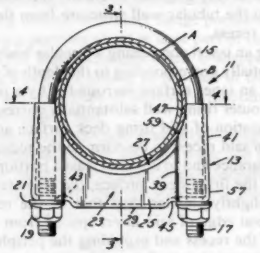
that at least a portion of the surface of the pull element is provided with a toothed profile matching with a counterprofile on the clamping lever.

4,229,863

SADDLE CLAMP ASSEMBLY

Lloyd L. Bowden, and C. Burton Dickinson, both of Clawson, Mich., assignors to Dickinson & Bowden Associates, Inc., Farmington, Mich.

Filed Sep. 25, 1978, Ser. No. 945,604
Int. Cl.[2] B65D *63/00*
U.S. Cl. 24—277 **2 Claims**



1. A saddle clamp assembly comprising a hollow unit saddle body of general U-shape in cross section, said body including a bottom wall apertured adjacent its ends;

the edges of said bottom wall terminating in upturned side walls;

said side walls having opposed substantially semi-circular inner edge portions;

said side walls being inclined inwardly towards upper edges, said semi-circular inner edge portions being parallel;

end portions of the bottom wall terminating in integral upturned continuous formed sockets;

edge portions of said side walls and corresponding portions inwardly of said edge portions above said sockets being oppositely inturned defining substantially tubular extensions above said sockets;

said saddle body being formed from a unit blank, with said side walls formed as integral extensions of said bottom wall and with said sockets and tubular extensions formed as integral extensions of said bottom wall and portions of said side walls;

said semi-circular inner edge portions being in engagement, forming a double wall thickness gripping area;

said sockets thoughout their exterior surfaces extending to and being integral with said side walls respectively, being continuous in plan and flowed as a unit part of said bottom wall and adjacent portions of said side walls;

said inturned edge portions of said sockets being inclined upwardly and outwardly defining V-shaped notches outwardly of said U-bolt;

the inturned corresponding portions of the side walls inwardly of said edge portions above said sockets being inclined upwardly and outwardly at said semi-circular edge portions defining V-shaped notches, and curved to form an extension of said semi-circular edge portions;

a U-bolt having threaded ends projected through said tubular extensions, sockets and bottom wall;

and adjustable fasteners mounted over said threaded ends operatively engageable with said bottom wall;

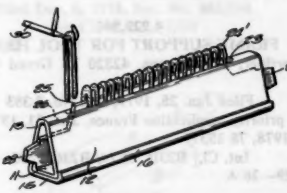
the arcuate inner edge portions of said side walls merging with the upper inner ends of said tubular extensions and tangential to the U-bolt; to define between said U-bolt, said saddle inner edge portions and adjacent portions of said tubular extensions an internal annular gripping surface extending throughout 360 degrees.

4,229,864

YARN HOLDER AND DISPENSER FOR MAKING HOOKED RUGS

Georgia A. Rankin, Highway 42-57, Sturgeon Bay, Wis. 54235

Filed Apr. 4, 1979, Ser. No. 27,172
Int. Cl.[3] D03D *7/00*; D03G *3/02*
U.S. Cl. 28—147 **9 Claims**



1. A yarn holder comprising:

a generally planar section having a slot across which yarn may be placed,

an ejector blade section hinged to said planar section and having an edge portion that is sized for passing into said slot such that when said blade section is folded on its hinge over said planar section and advanced through said slot from one of its sides a loop will be formed in said yarn on the other side of said slot.

4,229,865

MACHINE FOR LASER SCRIBING AND WINDING METALLIZED FILM CAPACITOR BLANKS

William J. Fanning, Glen Ellyn, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,153
Int. Cl.[3] H01G *4/32*
U.S. Cl. 29—25.42 **29 Claims**

1. A machine for processing a film having one surface thereof provided with a metallic coating, which comprises:

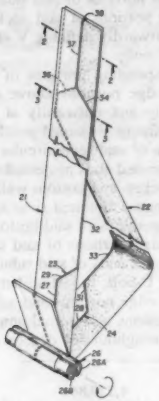
a drum;

roller means positioned on opposite sides of the axis of the drum for guiding the film to ride over and engage a portion of the periphery of said drum with metallic coating being exposed;

means for rotating the drum;

a pinch roller means for forcing the film against the periphery of the rotating drum to advance and dispense the film;

means acting on the metallic coating as the film passes over the periphery of the drum for removing a portion of the metal coating from the exposed metallic coating to form a demetallized pattern defining line in the metallic coating;



a mandrel for receiving the film emanating from said drum; and

means for rotating said mandrel independently of the drum rotating means to wind the film with a constant tension being imparted to successively wound convolutions.

4,229,866

FRAME SUPPORT FOR TOOL HEAD

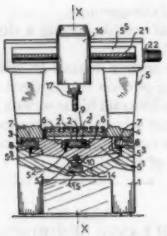
Pierre Berthier, Le Collenon, 42320 La Grand Croix, Loire, France

Filed Jan. 25, 1979, Ser. No. 7,353

Claims priority, application France, Jan. 31, 1978, 78 03450; May 18, 1978, 78 15377

Int. Cl.³ B23B *39/14*; B23C *1/00*

U.S. Cl. 29—26 A **15 Claims**



1. Support apparatus for a movable tool head drive for a machine tool, said apparatus comprising a stand, a table or workplate fixed on said stand for support of a workpiece, a movable framework slidably supported by said stand and capable of movement relative to said table, said framework comprising an upper transverse member which supports a movable tool head adapted for support of a tool which is to operate on the workpiece, means for control, guidance and displacement of said framework and movable tool head with respect to said stand and the table, said framework comprising a closed vertical frame having spaced vertical posts and a lower transverse member mounted below said table of the machine, said vertical posts being joined by said upper and lower transverse members to provide the closed configuration of said frame.

4,229,867

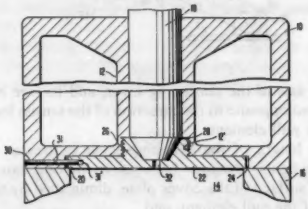
METHOD OF REPAIRING OR MODIFYING THE FIRING DECK OF AN INTERNAL COMBUSTION ENGINE

Boyd L. Spencer, Gladewater, Tex., assignor to Spencer Heads, Inc., Gladewater, Tex.

Division of Ser. No. 752,271, Dec. 20, 1976, Pat. No. 4,112,906. This application Jun. 16, 1978, Ser. No. 916,067

Int. Cl.³ B23P *15/00, 7/02*

U.S. Cl. 29—156.4 R **6 Claims**



1. A method of repairing or modifying an internal combustion engine having a coolant jacketed engine body including at least one combustion chamber having a firing deck surface with a critical area surrounding an ignition device being sealed from the coolant jacket by a generally tubular shaped wall structure, comprising

providing said firing deck area with a recess encompassing the area subject to the greatest strain during operation, said recess being disposed axially of the ignition device and including a floor spaced inwardly from said firing deck and surrounded by a peripheral wall extending between said floor and said deck,

drilling an axially disposed internally threaded bore extending into the tubular wall structure from the floor surface of said recess,

providing an insert comprising a circular body of a thickness substantially corresponding to the depth of said recess and having an inner surface surrounded by a peripheral edge and an outer firing wall substantially corresponding to the configuration of said firing deck surface and nesting said insert in said recess to conform to the recess with peripheral clearance and to cover at least a portion of the critical area of the firing deck surface, the diameter of said insert being slightly smaller than that of the recess with the peripheral edge of said insert spaced from the peripheral wall of the recess and providing the peripheral clearance as an expansion area for said insert to accommodate absorption by said insert of heat and strain independently of the engine body, and comprising a centrally disposed externally threaded boss of reduced diameter extending axially from the inner surface of said insert body and threadable into the internally threaded bore in said engine body for securing the insert and body together, and

inserting said insert boss said internally threaded bore and rotating said insert to thread said boss into said bore until the inner surface of said insert body firmly engages the floor of said recess to transmit heat therebetween, the thickness of said insert being substantially equal to the depth of said recess with the exposed surface of said insert generally contiguous with and conforming to said engine body surface surrounding said recess, said boss having an axially disposed opening therethrough and including a portion defining a set for said ignition device and an opening for exposing said ignition device to said combustion chamber, whereby said insert body is centrally fixed by said boss relative to the point of combustion in said cham-

ber but is free to expand radially from said boss as it absorbs heat of combustion without stress or strain, and

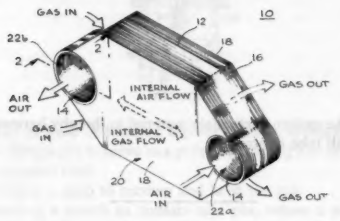
further providing an insert that can expand radially as a result of heat absorption in said recess without restrictions in such radial expansion, said boss serving as the only means for fixedly attaching said insert body in said chamber.

4,229,868

APPARATUS FOR REINFORCEMENT OF THIN PLATE, HIGH PRESSURE FLUID HEAT EXCHANGERS

Karl F. Kretzinger, Simi Valley, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 26, 1978, Ser. No. 955,119
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 R **21 Claims**



1. Apparatus for the reinforcement of thin plate heat exchangers fabricated of stacked tube plates defining fluid passages and having manifold sections integrally formed with the heat exchanging sections thereof comprising:

a plurality of hoops positioned respectively between pairs of adjacent plates which are joined together in sealing relationship, each hoop being configured to extend from one adjacent plate to the next and overlap a common juncture of said plates, said hoop being joined in structural reinforcing relationship to the adjacent surfaces of said plates;

the plates being formed with outer flange portions and offset U-shaped ring portions about at least part of the manifold sections of the heat exchanger, each U-shaped ring portion having a base for joining to the base of the ring portion of the adjacent plate to develop a juncture plane for two adjacent plates; and

wherein the associated hoop is generally U-shaped in cross section, extends across the juncture plane and is brazed to the adjacent plates on both sides of the juncture plane and at both the flange and ring portions of the plates.

4,229,869

METHOD OF REPAIRING ALUMINUM PLATE FIN COILS

Michael E. Wendt, Mt. Washington, and Gerald J. Kushner, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 11, 1979, Ser. No. 47,507
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.4 **14 Claims**

1. The method of repairing defective tube end portion of a fin and tube heat exchanger, including end plates, a series of spaced parallel fins arranged between said end plates having apertures therein, tubes arranged in said apertures having their end portions extending through said end plates being dimensioned to receive the end portion of a connecting member to form a joint therebetween, comprising the steps of:

cutting off a defective tube end portion when present at a point adjacent its respective end plate,

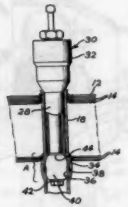
providing a stub tube member having a first portion dimensioned to be inserted in said tube and an expanded second portion dimensioned to receive the end portion of a connecting member,

forming at least one annular groove in said first portion of said stub tube member,

arranging sealing means in said annular groove,

inserting said first portion of the stub tube member in said tube so that said second portion is adjacent said end plate,

providing an expansion member being dimensioned to fit into said stub tube member;



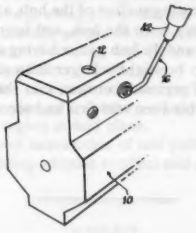
inserting said expansion member in said first portion of said stub tube and causing said expansion member to move said stub member and said tube outwardly to form a bulge in the area of said groove so that said sealing means in said groove provides an annular seal with the bulge having an inner diameter sufficient to prevent axial movement of said stub tube relative to said tube.

4,229,870

FREEZE PLUG INSTALLATION KIT

Ernest L. Tate, 9268 San Diego St., Spring Valley, Calif. 92077

Filed Dec. 6, 1978, Ser. No. 966,894
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—254 **1 Claim**



1. A freeze plug installation tool kit comprising:

(a) a plurality of selectable head sections each having one end defining a ball which selectably swivel mounts a releasible freeze plug carrier and another end which is a connector end there being a shank between said connector end and said ball-defining end and the shank of each of said head sections having a bend defining a different angle than the shank of every other of said head sections;

(b) a driver section having one end adapted to chuck into a pneumatic driver and another end which is a connector end;

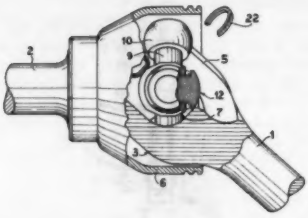
(c) a set of extension shaft sections of different lengths, each having two ends, both of which are connector ends adapted to releasibly connect to the connector ends of said driver section and any selected one of head sections to define one of numerous selectable single integral units when said selected head, shaft, and driver sections are connected together.

4,229,871

METHOD FOR PRESTRESSING AN AXIALLY RETAINED HOMOKINETIC JOINT

Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Jul. 31, 1978, Ser. No. 929,816
Claims priority, application France, Sep. 5, 1977, 77 26873
Int. Cl.[3] B23P 11/00
U.S. Cl. 29—407 4 Claims



1. A method for axially prestressing a homokinetic joint comprising a first tulip element for rigidly connecting to one of two shafts to be interconnected and defining raceways, a second element for rigidly connecting to the other of said shafts and comprising a hub and trunnions extending from the hub, the hub defining an axial bore and a radial bearing surface, rollers respectively rotatively and slidably mounted on the trunnions and received in the raceways of the first element, an axial retaining device comprising at least one thrust member slidably mounted in the axial bore of the hub, said thrust member comprising a radial shoulder in facing relation to the radial bearing surface of the hub, and a resiliently yieldable attachment fixed to an end of the tulip element, said method comprising, clipping the resiliently yieldable attachment onto the tulip element while the joint is in an assembled position, then determining for a position of alignment of said first and second elements the size of a gap between the shoulder of the thrust member and the bearing surface of the hub, axially shifting the thrust member away from the hub, and introducing between the thrust member and the hub a shim having a thickness which is so chosen as to be slightly larger than said gap, thereby providing an axial prestress between said thrust member and said hub and thus between said first and second elements.

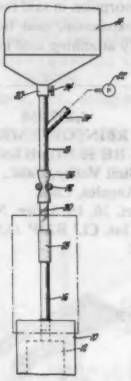
4,229,872

METHOD FOR FILLING AND SEALING A CONTAINER

Walter J. Rozmus, Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 18, 1978, Ser. No. 934,986
Int. Cl.[3] B22F 3/24; B65D 81/00; B65B 31/02
U.S. Cl. 29—420 3 Claims

1. A method for filling and sealing a container which is adapted to contain a particulate material under a pressure which is below ambient pressure, the container including a fill tube which is joined and sealed thereto comprising the steps of providing a source of particulate material and means for evacuating the container, connecting the fill tube of the container to the source of particulate material and to the means for evacuating the container, evacuating the container to a desired pressure below ambient pressure, filling the container and at least a portion of said fill tube with particulate material, heating a section of the filled portion of the fill tube to melt some of the particulate material in the fill tube, and cooling the fill tube to



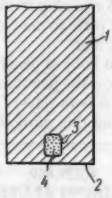
solidify the molten particulate material to thereby hermetically seal the fill tube container.

4,229,873

METHOD OF PRODUCING NONCONSUMABLE ELECTRODE FOR USE IN ARC TECHNIQUES

David G. Bykhovsky, Konjushenny pereulok, 1, kv. 18, and Vyacheslav G. Sobolev, ulitsa Aerodromnaya, 7, kv. 61, both of Leningrad, U.S.S.R.

Continuation of Ser. No. 677,859, Apr. 16, 1976, abandoned, which is a continuation of Ser. No. 466,255, May 2, 1974, abandoned. This application Sep. 15, 1978, Ser. No. 942,908
Int. Cl.[3] H01T 17/00; H01J 9/04
U.S. Cl. 29—420 5 Claims



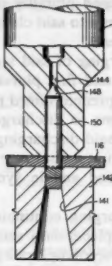
1. A method of producing a nonconsumable electrode ready for use in arc techniques without working-in operations, said method comprising forming a blind hole in the working end face of a high melting core of an electrode, the hole extending axially in the electrode in substantially symmetrical relation therein, filling said blind hole with pulverized doping agents, compressing the doping agents in said hole to a depth of about 3/5 the depth of the blind hole, filling the remaining portion of the hole with a mixture of the pulverized doping agents and a powder of the high melting core material, said high melting core material being present in a predominant amount in said mixture and heating the mixture from the surface of the electrode until a permanent fused surface layer is formed at the hole to produce an enclosed space with doping agents in the electrode wherefrom the doping agents can diffuse through the fused surface layer and provide constant and stable operating characteristics at the working end face of the core.

4,229,874

METHOD OF MOUNTING A PIVOT INSERT

William J. Schultz, Lynnfield, Mass., and Carl F. Van Bennekom, Green Valley, Ariz., assignors to General Electric Company, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 948,191
Int. Cl.[3] B23P *11/00*
U.S. Cl. 29—432 6 Claims



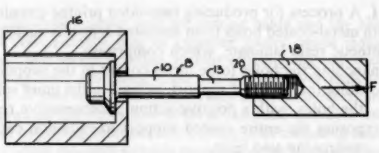
1. The method of forming a pivot element comprising:
providing a pin to serve as a pivot pin having a blunt end and a pointed end;
providing a strip to receive and hold the pin;
providing a punch to contain said pin, where a portion of said punch immediately above the point of said pin is recessed, and with a portion of the blunt end extending from said punch to a distance slightly greater than the thickness of said receiving strip;
placing said strip on a die having an opening of approximately the same cross section as that of the blunt end of the pin;
aligning the blunt end of the pin above the die hole and above the strip disposed on the die;
driving the punch to force the blunt end through the strip to remove a slug of metal from said strip as the pin acts on the strip.

4,229,875

METHOD OF PRESTRESSING BOLTS

Corey F. Crispell, Warminster, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 26, 1978, Ser. No. 973,477
Int. Cl.[3] B21K *1/46;* B21D *31/00*
U.S. Cl. 29—452 18 Claims



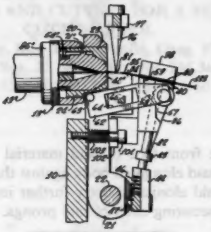
1. The method of forming threads in the shank of a bolt which comprises:
exerting a force on the shank of the bolt placing it in tension;
forming the threads in the shank while it is in tension; and
releasing the force after the threads have been formed;
whereby prestressed threads are provided.

4,229,876

OPTICAL FIBER BREAKER AND METHOD, AND COMBINATION BREAKER AND OPTICAL CONNECTOR

John S. Doty, Yucaipa, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Continuation-in-part of Ser. No. 905,294, May 12, 1978, abandoned. This application Aug. 29, 1978, Ser. No. 937,722
Int. Cl.[3] B26F *3/00*
U.S. Cl. 29—469 66 Claims



1. A breaker for optical fibers, which comprises:
(a) means to clamp one portion of an optical fiber having a cylindrical shape,
(b) means to clamp a second portion of said fiber at a location spaced from said one portion,
(c) means to bend to a predetermined degree of curvature the region of said fiber between said clamped portions thereof,
said degree of curvature being such that said fiber will, when scored transversely and while under a predetermined tension, break cleanly to provide mirror-like ends at the break,
(d) means to create said predetermined tension in said fiber region, and
(e) means to effect said transverse scoring of said fiber,
said scoring means comprising a blade edge and means to move said edge along a curved path which (1) lies in a plane substantially perpendicular to the axis of said fiber at the region of scoring, and (2) intersects the curved surface of said fiber in said plane,
the direction of curvature of said path being opposite to the direction of curvature of the intersected fiber surface region in said plane,
the degree of intersection of said path with said surface region being adapted to effect said clean break of said fiber.

4,229,877

FLORA ATTACHING DEVICE

James D. Fagan, 631 Deerwood Dr., Columbia, S.C. 29205

Filed Mar. 2, 1979, Ser. No. 16,846
Int. Cl.[3] B21D *39/00;* B23P *11/00;* A45F *5/08*
U.S. Cl. 29—509 12 Claims

1. A method of attaching the shank of a flora arrangement to the front side of clothing material comprising:
passing an elongated pin around the shank of said flora arrangement, said pin being of a deformable material and comprising a base and a pair of prongs extending away from said base;
deforming said pin to conform said base to at least a portion of the cross-sectional shape of said flora shank and said prongs to a substantially parallel spaced-apart relation;
passing at least a portion of each of said prongs through said clothing material so as to hold said flora shank between said base and the front face of said clothing material;
placing an elongated body against the rear face of said material, said elongated body having a substantially planar backing surface for abutting the rear face of said material

over a relatively large area around the points where said prongs pass through said material; and,

securing said prongs to said elongated body so as to press the base of said pin against said flora shank, said flora shank

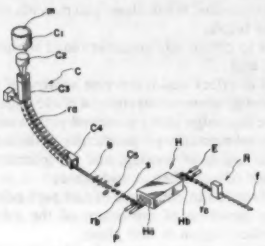
against the front face of said material and the backing surface of said elongated body against the rear face of said material, said elongated body further including retaining means for securing each of said prongs.

4,229,878

METHOD OF OPERATING A REHEATING FURNACE IN A HOT ROLLING LINE AND A REHEATING FURNACE EMPLOYED THEREFOR

Shigemi Ushijima, Nagaokakyo, Japan, assignor to Chugairo Kogyo Kaisha Ltd., Osaka, Japan

Filed Nov. 30, 1978, Ser. No. 965,707
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.7 **5 Claims**



1. A method for heating workpieces in a reheating furnace in a hot rolling line of the type including a casting system for continuously casting workpieces to be rolled, a heating system to receive said workpieces from said casting system and to heat said workpieces and a rolling system to receive heated workpieces from said heating system and to roll said workpieces at a rolling speed greater than the casting speed of said casting system, said heating method comprising:

(1) providing said heating system as a single reheating furnace having a longitudinal direction extending between a charging end adjacent said casting system and a discharging end adjacent said rolling system, and moving means for moving said workpieces through said furnace from said charging end thereof to said discharging end thereof, said moving means divided in said longitudinal direction into at least three walking beams each being independently movable in vertical and horizontal directions;

(2) successively charging a first plurality, equal to a rolling quantity of workpieces to be rolled by said rolling system in a single rolling cycle, of cast workpieces from said casting system into said charging end of said furnace at said casting speed;

(3) operating said walking beams to transport at a predetermined speed said first plurality of workpieces in said longitudinal direction through said furnace while therein heating said workpieces;

(4) upon the arrival of the leading of said first plurality of workpieces at said discharging end, operating said walking beams to interrupt said transport, and maintaining said first plurality of workpieces within said furnace while continuing said heating thereof;

(5) while said first plurality of workpieces are maintained and heated within said furnace, initiating the successive charging of a second plurality of cast workpieces from said casting system into said charging end of said furnace at said casting speed;

(6) during the charging of said second plurality of workpieces, and after said first plurality of workpieces have been heated for a predetermined period of time, operating said walking beams to discharge said first plurality of workpieces from said discharging end of said furnace to said rolling system at a discharge speed greater than said predetermined speed and in synchronization with said rolling speed;

(7) during said discharging, continuing to charge said second plurality of workpieces into said charging end of said furnace, until said second plurality equals said first plurality;

(8) operating said walking beams to transport at said predetermined speed said second plurality of workpieces in said longitudinal direction through said furnace while therein heating said workpieces;

(9) upon the arrival of the leading of said second plurality of workpieces at said discharging end, operating said walking beams to interrupt said transport, and maintaining said second plurality of workpieces within said furnace while continuing said heating thereof; and

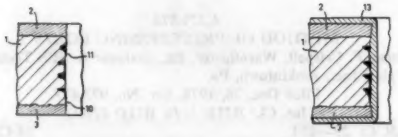
(10) subsequently sequentially repeating said steps (5), (6), (7), (8) and (9) for successive further pluralities of cast workpieces.

4,229,879

MANUFACTURE OF PRINTED CIRCUIT BOARDS

Charles M. P. Lindebrings, Ivry; Pierre Vaillagou, St. Remy les Chevreuse, and André J. F. Velte, Le Chesnay, all of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jul. 13, 1978, Ser. No. 924,228
Claims priority, application France, Jul. 28, 1977, 77 23251
Int. Cl.³ H05K *3/06, 3/22, 3/34*
U.S. Cl. 29—840 **3 Claims**



1. A process for producing two-sided printed circuit boards with metal-coated holes from insulated supports made of glass-synthetic resin laminate, which comprises

punching the holes to be metal-coated in the support,

coating the punched support, at least in the inner surface of the holes, with a positive-action photosensitive resin,

exposing the entire coated support to radiation capable of destroying said resin,

drying the support,

depositing conductive metal by chemical metal-coating in the holes on both faces of the support,

depositing a reserve in accordance with the pattern of a desired circuit,

etching the conductive metal on both faces,

positioning electrical components in the metal-coated holes

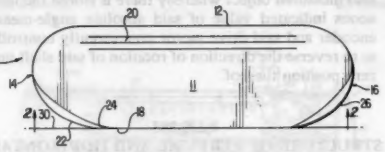
and soldering the tails of the components in the respective holes to provide for connections.

4,229,880

COMBINED EATING UTENSIL

Henry W. Brooks, Minot, N. Dak., and Gloria C. Nichol, 2005 S. Blautvelt, Sioux Falls, S. Dak. 57105, assignors to Gloria C. Nichol, Sioux Falls, S. Dak.

Filed Feb. 23, 1979, Ser. No. 14,721
Int. Cl.³ B26B *11/00*
U.S. Cl. 30—142 **4 Claims**



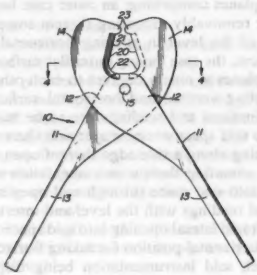
1. A one piece, combined eating utensil comprising a generally planar member having a longitudinally-extending straight bottom edge with the general shape of an elongated rectangle adapted to be positioned on a surface so that the bottom edge is in close contact with the surface whereby materials on the surface can be pushed by and pushed against the utensil, the bottom edge terminating in upwardly extending arcuate-shaped side portions, upper ends of the arcuate-shaped side portions being connected to each other to define the top of the utensil, at least one of the arcuate-shaped side portions having a part thereof sharpened to define a cutting edge, the top of the utensil including a profiled portion positioned above the bottom edge and adapted to be held by a user of the utensil.

4,229,881

PLIERS TYPE CUTTING TOOL AND THE LIKE

Ronald L. Troxel, 51 Bergen Ave., Sewell, N.J. 08080

Filed Mar. 2, 1979, Ser. No. 16,920
Int. Cl.³ B26B *13/06*
U.S. Cl. 30—254 **1 Claim**



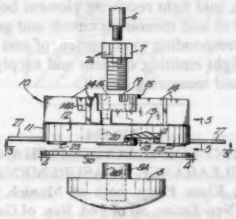
1. A pliers-type cutting tool for cutting cable and the like, said tool comprising a pair of crossing levers, pivot means connecting said levers together at their crossing regions, manual gripping arms extending from one pair of lever ends for movement of said arms toward and away from each other, and cutting jaws on the other pair of lever ends and movable into and out of overlying relation, said cutting jaws including laterally inner edges movable slidably past each other upon said jaw movement to effect shearing action, said laterally inner edges each including a substantially straight distal portion extending from a radially outer point generally radially inwardly and obliquely laterally outwardly of the respective jaw to combine with each other in defining an included angle facing toward said pivot means, for urging an intermediate work piece toward said pivot means, said laterally inner edges each including an arcuately concave proximate portion extending continuously from each distal portion generally radially and laterally inwardly from a respective distal portion, said proximate portions combining to capture an interposed work piece and shear the latter, and a nub on each of said laterally inner jaw edges located radially outwardly of said radially outer point and projecting generally toward each other normal to said distal edge portions, for retaining relation with a work piece before said jaws move into said overlying relation.

4,229,882

CUTTER HEAD AND CUTTERS FOR A VEGETATION CUTTING TOOL

Eldrick D. Chartier, Box 214, Yoncalla, Oreg. 97499

Filed Sep. 27, 1978, Ser. No. 946,364
Int. Cl.³ A01D *55/18*; A01G *3/06*
U.S. Cl. 30—276 **9 Claims**



1. A rotary cutter head for attachment to the driven shaft of a motorized hand supported apparatus for cutting vegetation, said cutter head comprising,

a flexible metal cutters each of hook shaped configuration at one end and having a substantially straight exposed cutting segment at its opposite end,

a circular body removably coupled to said shaft, said body including a central boss and radially offset abutments constituting cutter retention means engaging each of said cutters at spaced apart points therealong so as to permit flexure of the cutter along its length to minimize cutter breakage,

said cutters in partial overlying relationship with one another,

a closure plate for attachment to said main body, and

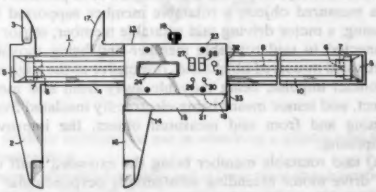
a retainer engageable with said body for closure plate retention.

4,229,883

MEASURING INSTRUMENT WITH DIGITAL DISPLAY

Takashi Kobashi, Utsunomiya, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed May 3, 1979, Ser. No. 35,899
Claims priority, application Japan, May 4, 1978, 53/53460
Int. Cl.³ G01B *7/02, 5/02*
U.S. Cl. 33—143 L **2 Claims**



1. A measuring instrument with digital display comprising:

a relatively elongated instrument body including a measur-

ing part adapted to make measuring engagement with an article to be measured;

a transparent scale fixedly disposed on an upper surface of said instrument body with its axis extending in a longitudinal direction of said instrument body, said linear scale further being disposed perpendicularly to said body such that a calibrated face of said linear scale forms a right angle with said upper surface of said body;

a slider freely slidable in said longitudinal direction of said instrument body and including a measuring part disposed opposite to said measuring part of said instrument body;

a measuring circuit mounted in said slide and including a digital display means;

a transparent index scale mounted in said slider having a calibrated face disposed opposite to said calibrated face of said linear scale in slightly spaced apart relations; and

a light emitting element and a light receiving element mounted in said slider and disposed opposite to each other with said linear scale and said index scale interposed therebetween, said light receiving element being electrically connected to said measuring circuit and generating pulse signals corresponding to movement of said calibrated face past said light emitting element and supplying said pulse signal to said measuring circuit.

4,229,884

ARRANGEMENT FOR ELECTROMECHANICAL AXIAL CLEARANCE MEASUREMENT

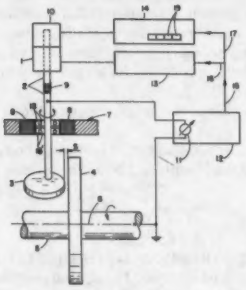
Hartwig Knöll; Klaus Högg, both of Munich, and Hermann Laudenberg, Neu-Esting, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,858

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807297

Int. Cl.³ G01B 7/14

U.S. Cl. 33—174 L **6 Claims**



1. In an arrangement for the electromechanical measurement of the axial clearance of rotating elements, particularly for the measurement of the axial clearance of shafts in high-speed turbomachinery, including a housing fixed in position relative to a measured object; a rotatable member supported in said housing; a motor driving said rotatable member; sensor means connected to said rotatable member and being movable towards said measured object and, responsive to the triggering of a contact impulse, being movable away from said measured object, said sensor means being electrically insulated from said housing and from said measured object, the improvement comprising:

(a) said rotatable member being the extended shaft of said drive motor extending substantially perpendicular to the axis of rotation of a rotating element in the operating condition of the former and parallel to the measured object; said sensor means including an eccentric feeler fastened to the end of said shaft proximate the measured object;

(b) an absolute angle-measuring encoder for defining the zero position of said shaft and determining a change in distance between said eccentric feeler and said measured object from a concurrently occurring change in the angle of rotation of said shaft; and

(c) indicator means for measuring a contact resistance so as to generate a contact signal responsive to falling below a resistance threshold value between the electrically-insulated eccentric feeler and said measured object during movement of said eccentric feeler in a direction towards said measured object whereby there is stored the instantaneous indicated value of said absolute angle-measuring encoder and said drive motor concurrently controlled so as to reverse the direction of rotation of said shaft into the zero position thereof.

4,229,885

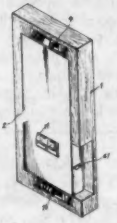
STRUCTURE OF VERTICAL AND HORIZONTAL SURVEYING INSTRUMENT

Chuang-Min Chiou, No. 415, Yung An Rd., T'ao Yuan, T'ao Yuan City, 330, Taiwan

Filed Mar. 21, 1979, Ser. No. 22,495

Int. Cl.³ C01C 9/04

U.S. Cl. 33—376 **4 Claims**



1. A level for determining whether surfaces are in horizontal and vertical planes comprising; an outer case having an internal space for removably mounting therein some instrumentation for use of the level in gauging horizontal surfaces and vertical surfaces, the case having outer flat surfaces disposed in intersecting planes at ninety degrees to each other for respectively contacting vertical and horizontal surfaces on which level determinations and readings are to be made, said case being open to said space at one major side thereof and having a lateral opening along a side edge thereof open to side space; an enclosure mounting therein instrumentation and insertable alternatively into said space through said open major side for taking vertical readings with the level and insertable into said space through said lateral opening into said space for placing of the case in a horizontal position for taking horizontal readings with the level; said instrumentation being disposed in said enclosure comprising a gravity-responsive depending pendulum having a weight on a free end thereof, means to pivotally mount the pendulum for movement laterally in a plane, a pivot for said depending pendulum for having the pendulum in a depending position when taking readings on vertical and horizontal surfaces, and indicating means having a scale indicia representative of the weight position relative to the vertical for indicating jointly with the weight deflection of the pendulum relative to an exactly vertical plane thereby to indicate how much a vertical surface or a horizontal surface respectively is out of verticality or out of level, said indicating means comprises a pivoted depending pointer coactive with the pendulum and displaced by said pendulum from the vertical proportionately to any displacement the pendulum indicates a surface read varies from the vertical or from the horizontal, said pendulum comprises a pivot for said pointer fixed on an upper end thereof and having two oppositely disposed flat sides, said

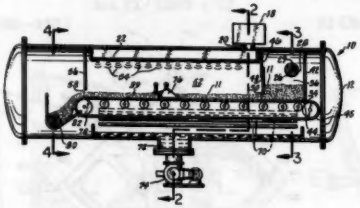
pointer having two knife-edges defining oppositely flat sides, said pointer for defining lateral pivoting of the pointer laterally under control of the pendulum to an extent a surface being read is not a plane parallel to said flat sides.

4,229,886

MICROWAVE HEATED VACUUM DRYER FOR POWDERS

Dick Q. Durant, Manchester, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 9, 1979, Ser. No. 18,899
Int. Cl.³ F26B *13/30*
U.S. Cl. 34—92 **23 Claims**



1. A dryer for material including:
a pressure vessel having an inlet end and an outlet end;
means for reducing the pressure within said vessel;
means for introducing microwave energy into said vessel;
means for transporting the material in the vessel from the inlet end to the outlet and while the material is being subjected to microwave energy at the reduced pressure for at least a portion of the travel thereof;
a first continuous conveyor for transporting the material into said inlet end of said vessel while the reduced pressure is maintained; and
a second continuous conveyor for transporting the material from said outlet end of said vessel while the reduced pressure is maintained, said first continuous conveyor for transporting the material into said inlet end of said vessel including:
an inlet hopper for the material;
a cylindrical member extending from said hopper to said inlet end of said pressure vessel; and
a worm screw positioned for rotation within said cylindrical member from said hopper to said inlet end of said pressure vessel which transports the material from said hopper to said inlet end of said pressure vessel, said worm screw having a predetermined outer diameter and said cylindrical member having an inner cylindrical surface of a diameter generally similar to said predetermined outer diameter of said worm screw,
a predetermined length so that the material in said hopper and said cylindrical member acts to prevent the passage of air therethrough,
an inlet end at said hopper and an outlet end in said vessel, said outlet end including a plurality of openings transverse to said means for transporting the material in the vessel from the inlet end to the outlet end thereof for distributing said material thereon.

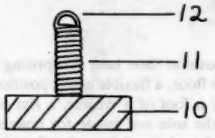
4,229,887

UNIVERSAL ELECTRICAL CONSTRUCTION SET

John J. Lukits, 1843 6th St., Manhattan Beach, Calif. 90266

Filed Sep. 29, 1978, Ser. No. 947,202
Int. Cl.³ G09B *23/18*
U.S. Cl. 35—19 A **1 Claim**

1. A Universal Electrical Construction Set consisting of connectors, hook-up wires, adaptors, and indicators, the connectors being a series of spring-bearing disks, the diameter and color of which correlate with the number of springs supported, in such manner that the diameter in inches of the nth disk is given by $d(n)=\frac{1}{4}(n+5)$ for n ranging from 1 to 9 or 10, and in such manner that the disk colors correlate with the number of springs supported, conforming colorwise and numberwise with the well-established resistor color code, and in such manner that the springs are arranged in the most symmetric way for the number that are supported by any given disk, and the primary purpose of which is to provide both a means for attachment generally accompanied by support for electrical circuit components and a means for attachment of hook-up wires that extend between circuit components, the hook-up wires being a set of wires with different lengths such that the lengths grow by $\frac{1}{4}$" increments beginning at 1", coded in such manner that the insulation color for any wire indicates the highest whole number of inches of insulated wire, in accordance with the resistor color code, and in such manner that each additional $\frac{1}{4}$" of insulated wire above the highest whole number of inches is indicated by a band around the wire, to a maximum of 3 bands, the adaptors being accommodative, go-between devices, each of which consists of a solder-lug and an alligator-clip with a short bendable wire or spring extending between them, and each of which extends when needed between a spring of a connector and a lead or pin of a circuit component thus serving as a means for accommodating otherwise unattachable components, the indicators being a series of colored beads each of which has permanently associated with it a solder-lug for attachment of the bead to the spring of a connector thereby serving as a means for associating with any spring of any connector a number or whatever that is arbitrarily associated with the color of the bead, the colors employed again being those of the resistor color code.

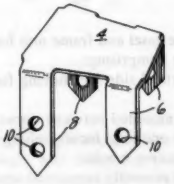


4,229,888

FASTENER SUITABLE FOR ATTACHING A HEEL TO A SHOE

Francis F. H. Rawson, Loughborough, England, assignor to USM Corporation, Farmington, Conn.

Filed Mar. 8, 1979, Ser. No. 18,501
Claims priority, application United Kingdom, Jul. 28, 1978, 31530/78
Int. Cl.² A43B *21/36, 23/20*
U.S. Cl. 36—1 **15 Claims**



1. A fastener suitable for use in attaching a plastic heel to a shoe, comprising:
a generally flat head portion and at least three shank portions extending from the head portion parallel to one another and generally normal to the head portion, each shank portion having at least one aperture therein.

4,229,889

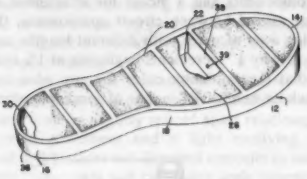
PRESSURIZED POROUS MATERIAL CUSHION SHOE BASE

Charles Petrosky, 1118 N. Jefferson St., Arlington, Va. 22205

Continuation-in-part of Ser. No. 678,658, Apr. 20, 1976, Pat. No. 4,129,951. This application Jun. 6, 1978, Ser. No. 913,149

Int. Cl.[2] A43B *13/18, 13/20*

U.S. Cl. 36—28 10 Claims



1. An air cushion shoe base comprising a flexible sole for contacting the floor, a flexible insole positioned above the sole for contacting a foot of a wearer, a rim extending around a periphery of the sole and insole for connecting the sole and insole in airtight relationship, and a flexible porous core of a foam material having cells and fine pores extending across the rim between the sole and the insole for dividing the shoe base into plural small inflatable compartments each filled with foam material, each compartment having small metering pores for flowing fluid through from one section to another section of the core and means joining the sole, the rim, the insole and the core in airtight relationship.

4,229,890

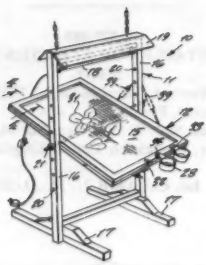
PICTURE-MAKING EASEL AND FRAME

Marion Dropinski, 1305 Hartford St., Colorado Springs, Colo. 80906

Filed May 25, 1978, Ser. No. 909,543

Int. Cl.[3] D05C *1/02;* D06C *3/08*

U.S. Cl. 38—102.1 1 Claim



1. An adjustable easel and frame unit for supporting needlework and the like comprising:

A. a pair of vertical side legs having feet at the lower ends thereof;

B. lamp means mounted between upper ends of said legs;

C. spaced-apart openings located along each leg in order to selectively receive a bolt;

D. a frame unit pivotally supported upon said easel by said bolt;

E. said frame unit comprises upper and lower frame means, said upper means including a plurality of downwardly extending nails and said lower means including a plurality of openings into which said nails are receivable, whereby needlework may be retained in a stretched condition between said frame means by said nails of said upper frame passing through said needlework into the openings of the lower frame;

F. means for clamping said upper and lower frames means together; and;

G. cup means supported upon said frame unit for holding needle-working material.

4,229,891

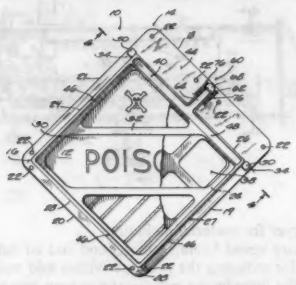
PLACARD HOLDING DEVICE

Robert L. Keller, Neenah, Wis., assignor to J. J. Keller & Associates, Inc., Neenah, Wis.

Filed Dec. 11, 1978, Ser. No. 968,116

Int. Cl.[3] G09F *3/18*

U.S. Cl. 40—17 9 Claims



1. A placard holding device for displaying a placard upon a vertical planar surface comprising:

a back frame member adapted to be mounted upon the vertical planar surface and including a plurality of adjoining back frame peripheral edges;

a front frame member having a flat surface portion enclosing an open window area, said flat surface portion including a plurality of adjoining front frame peripheral edges enclosing said open window area, with the number of said front frame edges corresponding with the number of said back frame edges;

fastening means for mounting said front frame member on said back frame member and including an upstanding lip integral with said back frame member and extending perpendicularly along all but one of said back frame edges, said one back frame edge comprising a rear smooth edge, a groove integral with said front frame member and extending along all but one of said front frame edges, said one front frame edge comprising a front smooth edge, said groove symmetrically disposed for co-extensive engagement with said upstanding lip when said front frame member is mounted on said back frame member;

an interior placard holding pocket formed intermediate said back frame member and said flat surface portion when said front frame member is mounted on said back frame member, said placard holding pocket peripherally enclosed by said upstanding lip along all but said rear smooth edge and including an access slot formed intermediate said front and rear smooth edges;

a locking arm integral with and extending from said front smooth edge, said locking arm being generally resilient and having a normal generally coplanar position relative to said flat surface portion for permitting passage of the placard through said access slot and movable from said normal position toward a displaced position; obstructing means on said back frame member located on said rear smooth edge and arranged for engagement by said locking arm when said locking arm has been displaced from said normal position and together with said displaced locking arm blocking movement of the placard into and out of said placard holding pocket; and locking means for maintain-

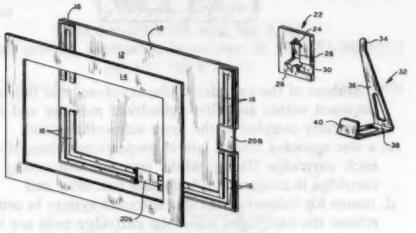
ing said engagement between said displaced locking arm and said obstructing means while permitting selective movement of said locking arm between said displaced position and said normal position.

4,229,892

DISPLAY DEVICE

O. William Hueter, 2970 Airport Hwy., Toledo, Ohio 43609, and Richard A. Gross, Perrysburg, Ohio, assignors to O. William Hueter, Toledo, Ohio

Filed Jan. 24, 1979, Ser. No. 6,089
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152.1 **12 Claims**



1. A display device comprising:

a panel having an outer periphery and front and rear planar surfaces;

a tab receiving chamber formed along the marginal edge portion of said panel;

an adapter element attached to the rear planar surface of said panel and having at least one aperture formed therein for receiving a suitable hook for hanging the panel with one of its axes in generally horizontal position and having at least one slot formed therein; and

a support member having an upper tab insertable into the slot in said adapter element and a lower tab insertable into the tab receiving chamber formed along the marginal edge of said panel, said support member including a foot portion attached to the lower tab and extending away from the rear surface of said panel defining a lower planar surface for supporting the panel in a free standing mode on a supporting planar surface, wherein the planar surface of the foot is adapted to be on the plane of the supporting surface.

4,229,893

FLUID DISPENSING APPARATUS AND DISPLAY MEANS

Thomas F. Uys Naude, Capetown, South Africa, assignor to Optic Ads (Pty.) Limited, Capetown, South Africa

Filed Sep. 26, 1978, Ser. No. 945,818
Claims priority, application South Africa, Sep. 29, 1977, 77/5204
Int. Cl.³ G09F *23/04*
U.S. Cl. 40—332 **8 Claims**

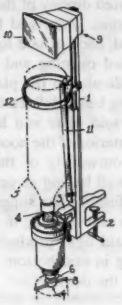
1. Advertising apparatus for use with a device for dispensing liquids from inverted bottles comprising:

a support bracket;

a resilient mounting projecting from the bracket and adapted to locate a liquid metering device and a bottle attached thereto;

Electrically operated attention-drawing means; and

a switching circuit for operating the attention-drawing means said switching circuit being closed by movement of



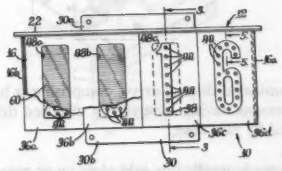
the bottle on the resilient mounting when the liquid metering device is activated.

4,229,894

ILLUMINATED NUMBER DISPLAY DEVICE

John P. Beck, 2507 Glendale Way, Michigan City, Ind. 46360

Filed Aug. 19, 1977, Ser. No. 825,933
Int. Cl.² G09F *13/06*
U.S. Cl. 40—579 **8 Claims**



1. A device for displaying a visually observable number or the like during daylight and displaying the same but illuminated number or the like during nightime, said device comprising a housing having an interior chamber defined in part by a front wall, said front wall having at least one opening therethrough in light communication with said interior chamber, light producing means supported within said chamber and adapted to be electrically energized to emit light through said opening, and a plurality of discrete, individual indicia display plates mounted on said front wall, each of said indicia display

plates having means thereon for attaching the same to said housing and in position in front of said opening and for juxtaposition next to adjacent indicia display plates to provide the visually observable number, each of said indicia display plates having an identifying indicia thereon visible in daylight and each having a plurality of light transmitting channels therethrough overlying said opening and disposed in a pattern providing an illuminated display of the same identifying indicia visible during nighttime when said light producing means is electrically energized, each of said light transmitting channels being an unobstructed opening and having an axis disposed substantially perpendicular to the plane of said display member, each said opening being defined by a frustoconical surface being integral with said plate and having a larger diameter opening facing the interior of the housing and a smaller diameter opening facing outwardly of the housing, said housing including a bottom wall having an opening therethrough, and including a light diffusing plate supported by said housing in overlying relation to said opening in said bottom wall so that light emitted from said light producing means is transmitted through said opening in said bottom wall to provide general illumination beneath the device.

4,229,895

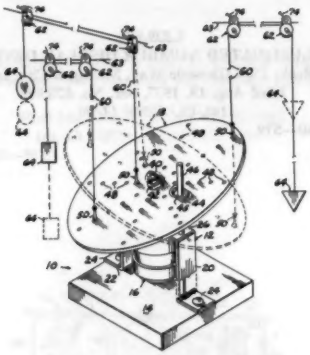
OSCILLATING PLATE ANIMATED MOTION DISPLAY MACHINE

Thomas L. Byers, 3000 SW. 60, Oklahoma City, Okla. 73159

Continuation-in-part of Ser. No. 807,716, Jun. 17, 1977, Pat. No. 4,132,021. This application Dec. 18, 1978, Ser. No. 970,677

Int. Cl.³ G09F *19/00*

U.S. Cl. 40—614 **6 Claims**



1. An aminated display drive, comprising: a base;
motor means having a vertically disposed drive shaft supported by said base;
a plate;
axle means journalled by said plate on an axis inclined with respect to the axis of said drive shaft;
bracket means interposed between and connected with said drive shaft and said axle means;
means for preventing angular rotation of said plate with said drive shaft; and,
at least one flexible strand radially connected, at one end, with said plate and connected, at its other end, with an element to be animated.

4,229,896

RAPID LOADING DEVICE FOR A REVOLVER

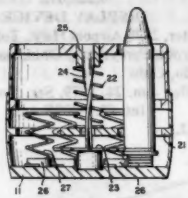
Mike Jurich, III, 221 28th Pl., Manhattan Beach, Calif. 90266

Filed Feb. 7, 1979, Ser. No. 10,170

Int. Cl.³ F42B *39/04*

U.S. Cl. 42—89 **5 Claims**

1. A rapid loading device for a revolver which provides releasable securement of cartridges in condition for simultaneous loading of the cartridges in the chambers of the cylinder of the revolver, said rapid loading device comprising:
a. a first cylindrical member having an open end and a closed end which forms the base of said rapid loading device;
b. a first disc having a center bore and a plurality of axially extending, radially distributed cartridge-receiving bores adapted to align with and introduce the cartridges into the



chambers of the cylinder of the revolver, said first disc is disposed within said first cylindrical member and is mechanically coupled to the inner sidewall thereof;
c. a star sprocket whose lateral projections releasably lock each cartridge flange while laterally supporting each cartridge in conjunction with said first disc; and
d. means for releasing said star sprocket system in order to release the cartridges when the cartridge ends are in the chambers of the cylinder of the revolver.

4,229,897

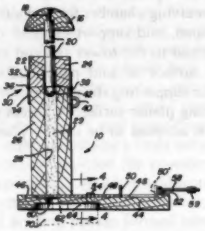
MUZZLE LOADING APPARATUS

Jimmy C. Snowden, 72 Western Dr., Pine Bluff, Ark. 71602

Filed Oct. 17, 1978, Ser. No. 953,891

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—90 **10 Claims**



1. Apparatus for loading a premeasured charge of propellant and a ball in a muzzle loaded firearm, the apparatus comprising a plunger assembly for receiving said charge and said ball, and a mounting and loading assembly attached to the plunger assembly for mounting on the muzzle loaded firearm and depositing said charge and said ball thereinto, said firearm being a rifle, said porpellant being black powder, and said plunger assembly comprising a plunger slidingly contained within a plunger housing, the mounting and loading assembly comprising a platform having release means for acting in cooperation with said plunger to deposit said charge and said ball into said rifle and having a recess for conformingly mounting the apparatus on the barrel of said rifle held in an upright position, said plunger housing comprising an elongated block having a longitudinal bore, said plunger having a handle for manual sliding extension and retraction of the plunger within said longitudinal bore, said platform having a platform bore in register with said

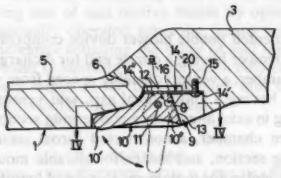
longitudinal bore, and said release means separating said longitudinal bore from said platform bore, said platform having a trough extending through said platform bore, said release means comprising a slide cover strip slidable within said trough to separate and close off said longitudinal bore from said platform bore, said apparatus further including holding means for releasably holding a percussion cap for use with said rifle.

4,229,898

FISHING ROD AND REEL MOUNTING HANDLE

Akio Urakami, Fuchu, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Jan. 19, 1979, Ser. No. 4,788
Claims priority, application Japan, Jan. 31, 1978, 53-10899[U]
Int. Cl.³ A01K *87/00*
U.S. Cl. 43—21.2 **4 Claims**



1. In a fishing rod and reel mounting handle including a rod holder at the front end thereof, a gripping portion at the rear end thereof, and an intermediate portion having a recessed portion for mounting a reel thereon, and a means for fixing a reel foot to the recessed portion, the improvement comprising:

(a) a blind bore recess formed in said intermediate portion at a position approximately opposite to said recessed portion,

(b) a trigger pivotably secured in said blind bore recess,

(c) a locking means disposed in said blind bore recess for selectively locking said trigger at a trigger extended position and a trigger retracted position, said trigger having one end surface thereof adapted to be substantially flush with a surface of said intermediate portion in the trigger retracted position,

whereby said trigger may be positioned in said extended position when a spin cast reel is mounted within said recessed portion, and in said retracted position when a spinning reel is hangingly mounted from said recessed portion, the position of said trigger being independent of the type of reel mounted upon said reel mounting handle.

4,229,899

VARIABLE DEPTH FISHING LURE SYSTEM

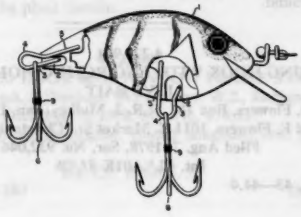
Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed Mar. 26, 1979, Ser. No. 23,681
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.09 **14 Claims**

1. A fishing lure system, comprising:

a set of fishing hooks including a plurality of interchangable hooks each of which includes a calibrated weight in the form of a collar affixed to said hook for adjusting its effective weight;

a lure body; and



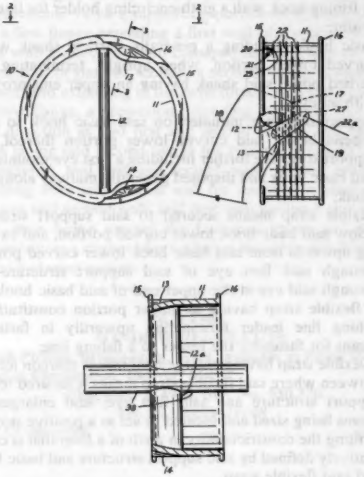
a hook hanger for attaching a selected one of said hooks to said lure body for adjusting the effective density of said fishing lure system.

4,229,900

FISHING APPARATUS

James R. Collins, 1528 S. Post Oak, Houston, Tex. 77056

Filed Aug. 16, 1978, Ser. No. 934,320
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—43.11 **2 Claims**



1. Fishing apparatus, comprising a tubular cylinder around which any selected length of fishing line may be randomly wound, and a crossbar interiorly across said cylinder fixedly connected between opposite sides of said cylinder adapted to be held by hand to support said cylinder, said crossbar being disposed adjacent an end of said cylinder whereby said crossbar may be grasped by the fingers of one hand while the thumb of the same hand is disposed at the exterior of the cylinder to be used to control fishing line wound therearound, said cylinder having a smoothly depressed outer surface portion inwardly flared toward the cylinder end adjacent which said crossbar is disposed and at one side of an end of said crossbar against which the thumb may be comfortably positioned while the fingers are disposed about said crossbar inward of said cylinder, said apparatus including a bar affixed to said crossbar and disposed transversely of said crossbar along the axis of said cylinder and extending to opposite sides of said crossbar

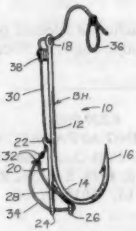
adapted for holding loosely by hand to permit rotation of said cylinder therearound and adapted for holding more firmly by hand to produce drag in the fishing line and adapted to be fixedly held by hand to prevent rotation of said cylinder therearound.

4,229,901

FISHING HOOK WITH ENCIRCLING HOLDER FOR LIVE BAIT

Gene D. Flowers, Box 181, R.R. 2, Mulkeytown, Ill. 62865, and David E. Flowers, 1011 E. Market St., Christopher, Ill. 62822

Filed Aug. 7, 1978, Ser. No. 932,046
Int. Cl.³ A01K *83/06*
U.S. Cl. 43—44.4 **5 Claims**



1. A fishing hook with a girth-encircling holder for live bait, comprising:

a basic hook including a generally vertical shank with a curved lower portion, when upright, terminating in a barbed point, said shank having an upper end provided with an eye;

a support structure mounted on said basic hook so as to depend below said curved lower portion thereof, said support structure further including a first eye mounted on said basic hook and disposed generally midway along said shank;

a flexible strap means secured to said support structure below said basic hook lower curved portion, and extending upwards from said basic hook lower curved portion, through said first eye of said support structure and through said eye at the upper end of said basic hook;

said flexible strap having an upper portion constituting a fishing line leader terminating upwardly in fastening means for fastening the leader to a fishing line;

the flexible strap having enlargement means thereon located between where said flexible strap means is secured to said support structure and said first eye; said enlargement means being sized and located to act as a positive stop for limiting the constrictability in girth of a loop that is cooperatively defined by said support structure and basic hook and said flexible strap,

said support structure being constituted by a wire rod armature having said first eye provided thereon and further having a second eye and a third eye provided thereon so that the second and third eyes are disposed below said curved lower portion of said basic hook and at generally the same level as one another;

the flexible strap being comprised of a section of fishing line led through said first, second and third eyes and then knotted to itself between said first and second eyes with a knot that is too large to fit through said first eye and thus constitutes said positive stop,

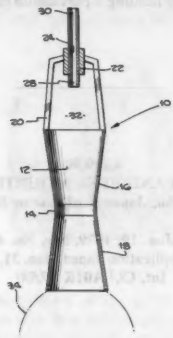
so that when an individual of live bait, such as a minnow, is inserted through the loop and the loop is constricted by pulling up on the leader relative to the basic hook the enlargement acts to prevent slicing through the live bait so that the live bait is juxtaposed beside the basic hook without being impaled thereby and thus is free to wriggle though harnessed from escaping.

4,229,902

AUGMENTED BUBBLE BLOWER DEVICE

Forrest D. Smith, P.O. Box 3784, Eureka, Calif. 95501

Filed May 8, 1978, Ser. No. 903,742
Int. Cl.³ A63H *33/28*
U.S. Cl. 46—6 **9 Claims**



1. An augmented bubble blower device comprising:

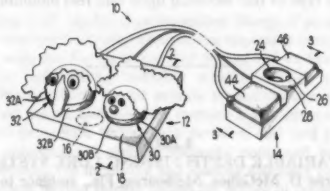
a tubular member having a nozzle end for dicharging gas, an open chamber, a venturi chamber spaced from said nozzle end and having a longitudinal axis, said venturi chamber including in axial alignment a converging section adjacent said open chamber, a constricted throat section, and a diverging section, and means for slidable mounting said tubular member for movement along said longitudinal axis toward and away from said venturi chamber, said means for mounting positioning said tubular member so that said nozzle end is adapted to discharge gas into said open chamber toward said venturi chamber approximatly along said longitudinal axis whereby gas discharged from said nozzle end enters said venturi chamber and draws additional gas from said open chamber into said venturi chamber, and means for supporting a film of bubble forming material in position to receive gas after said gas passes through said diverging section.

4,229,903

REMOTE CONTROLLED TALKING AMUSEMENT DEVICE

Howard J. Morrison, Deerfield, and John R. Wildman, North Riverside, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,807
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—232 **6 Claims**



1. A children's amusement device useful to improve a child's hand and eye coordination, comprising:

a base,

first transducer means secured to said base for transmitting an audible signal from said base,

at least two juxtaposed fanciful heads secured to said base,

each of said heads having at least one movable head portion,

said base having a pair of motive means for independently moving said head portion of each of said heads,

a control unit physically separate from said base, said control unit having mounted centrally thereon a second transducer means secured to said control unit for receiving an audible signal, said control unit also having a pair of opposed manually operated actuating means secured to said control unit on either side of said second transducer means, each of said actuating means operative to actuate one of said motive means to selectively move one of said head portions synchronously with respect to said audible output signal,

means for functionally interconnecting said base and said control unit for operating said amusement device and for simultaneously enabling said control unit to be physically remotely disposed from said base during operation of said amusement device, said functionally interconnecting means including means for electrically interconnecting said first transducer means and said second transducer means and means for operatively interconnecting said motive means and said actuating means, such that a child can operate said device by speaking into said centrally mounted second transducing means while simultaneously actuating one of said motive means by operating one of said manually operated actuating means with one hand and thereafter actuating the other of said means with the other hand to simulate a conversation between said fanciful heads while all the time speaking into said centrally mounted second transducer means.

4,229,904

METHOD AND DEVICE FOR FACILITATING THE WATERING OF HANGING PLANTS

Allen H. Burton, Box 83, Central Ave., Ocean View, Del. 19970

Filed Nov. 22, 1978, Ser. No. 962,963

Int. Cl.³ A01G *9/02*

U.S. Cl. 47—58 **6 Claims**

1. A method for facilitating the watering of hanging plants wherein the plant is in a hanging pot comprising the steps of disposing an elongated waterproof flexible container under the hanging pot with the container having a closed bottom and an open top of larger cross-sectional area than the cross-sectional area of the pot and with the container being deeper than it is wide, detachably securing the container to the pot thereabove with the container extending substantially, concentrically outwardly beyond the pot, tucking all hanging vines of the plant down into the container so that the plant and its vines are disposed within the periphery of the container, watering the plant by directing water to the pot from above, catching and collecting in the container any spillage from the watering of the plant in the pot, detaching the container from the hanging pot, removing the container away from the hanging pot and attaching the container to another hanging pot to facilitate the watering of the plant therein.

4,229,905

COMBINED DOOR AND WINDOW FRAME SYSTEM

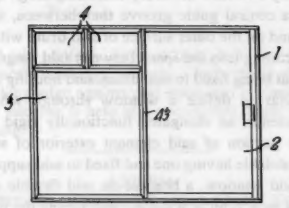
Jerome B. Rush, 3 Stanhope Pl., London, W.2., England

Filed Feb. 2, 1978, Ser. No. 874,557

Claims priority, application United Kingdom, Feb. 2, 1977, 4209/77

Int. Cl.² E06B *3/32*

U.S. Cl. 49—143 **11 Claims**



1. An elongate extruded metal frame member comprising in cross-sectional view: a supporting portion of hollow box section, a first flange extending a first wall of the box section to define with a second wall an L-shaped recess, a web extending a third wall of the box section, a second flange connected to said web and extending in the same direction as and parallel to said first flange, a projection extending from said web in the same direction as said first and second flanges and having a recess facing said second flange for retaining draught excluding material, said first and second walls having projections extending over said second wall for retaining a glazing bead adjacent said second wall, said first wall having a pair of adjacent claws facing toward the L-shaped recess and defining between them a channel for retaining draught excluding material or a glazing gasket.

4,229,906

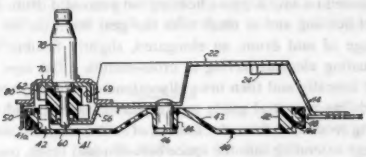
WINDOW REGULATOR

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Aug. 2, 1978, Ser. No. 930,376

Int. Cl.³ E05F *11/48*

U.S. Cl. 49—352 **6 Claims**



1. A window regulator comprising a circular drum having a flat peripheral portion having an annular flange extending axially from one side of said drum, the central portion of said drum extending laterally from its flat peripheral portion in the same direction as said annular flange, and a central tubular hub extending axially from said central portion of said drum in a direction opposite to that in which said flange extends, said annular flange and hub being generally axially coextensive, the inner surface of said annular flange having a circular array of

gear teeth thereon, the outer surface of said annular flange having a narrow guide flange extending raidally outwardly therefrom, a generally circular support housing having a drum supporting pin fixed centrally thereon and extending in the same direction from said support housing as said hub, said drum being mounted by its hub for rotation on said pin, said support housing having a circular housing flange extending therefrom in the same direction as said pin, said housing flange being spaced radially outwardly from said guide flange to define an annular confining space therewith, a pinion pivotally mounted on said support housing between said drum and support housing and in mesh with the gear teeth on the annular flange of said drum, an elongated, slightly flexible window actuating element having in cross-section a flat tape portion and laterally and then inwardly extending tangs spaced apart to define a central guide groove therebetween, said element being wound on the outer surface of said drum with said guide flange extending into the space between said tangs, one end of said element being fixed to said drum, said housing flange being discontinuous to define a window through which flexible element extends, an elongated functionally rigid support on which the portion of said element exterior of said support housing is slidable having one end fixed to said support housing adjacent said window, a bracket on said flexible element for attachment to a vehicle window, and means for rotating said pinion to drive said drum in opposite directions to move said bracket longitudinally of said support.

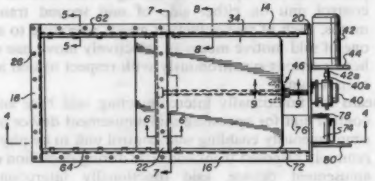
6. A window regulator comprising a circular drum integrally formed of plastic material and having a peripheral cylindrical flange and a central tubular hub concentric with said cylindrical flange, an intermediate portion of said drum connecting said flange to said hub comprising a conical portion, said cylindrical flange extending laterally from the periphery of said intermediate portion in one direction, said tubular hub extending laterally from said intermediate portion in the opposite direction, so that said conical portion constitutes a reinforcement between said cylindrical flange and said hub, said cylindrical flange and hub being generally axially coextensive, the inner surface of said annular flange having a circular array of gear teeth thereon, the outer surface of said annular flange having a narrow guide flange extending radially outwardly therefrom, a generally circular support housing having a drum supporting pin fixed centrally thereon and extending in the same direction from said support housing as said hub, said drum being mounted by its hub for rotation on said pin, said support housing having a circular housing flange extending therefrom in the same direction as said pin, said housing flange being spaced radially outwardly from said guide flange to define an annular confining space therewith, a pinion pivotally mounted on said support housing between said drum and support housing and in mesh with the gear teeth on the annular flange of said drum, an elongated, slightly flexible window actuating element having in cross-section a flat tape portion and laterally and then inwardly extending tangs spaced apart to define a central guide groove therebetween, said element being wound on the outer surface of said drum with said guide flange extending into the space between said tangs, one end of said element being fixed to said drum, said housing flange being discontinuous to define a window through which flexible element extends, an elongated functionally rigid support on which the portion of said element exterior of said support housing is slidable having one end fixed to said support housing adjacent said window, a bracket on said flexible element for attachment to a vehicle window, and means from rotating said pinion to drive said drum in opposite directions to move said bracket longitudinally of said support.

4,229,907

SLIDE GATE

George R. Hall, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Mar. 31, 1978, Ser. No. 892,175
Int. Cl.[3] E05F *11/34*
U.S. Cl. 49—362 10 Claims



1. Apparatus for selectively opening and closing a passageway comprising:

(a) a gate;

(b) frame means for guiding said gate;

(c) screw means mounted for rotational motion relative to said frame means; and

(d) lost motion coupling means for coupling said gate to said screw means and for converting rotational motion of said screw means into translational motion of said gate, and whereby said screw means may undergo rotational motion to a predetermined extent before said coupling means so converts said rotational motion of said screw means into translational motion of said gate, further comprising:

(i) a traveling nut threadedly engaged with said screw means;

(ii) follower means;

(iii) connection means joining said traveling nut with said follower means while permitting a predetermined spacing between said traveling nut and said follower means; and

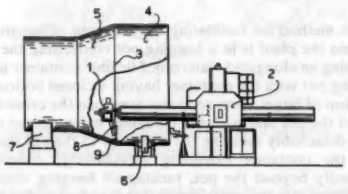
(iv) coupler means fixed relative to said gate for positioning between said traveling nut and said follower means whereby said traveling nut and said follower means may each separately engage said gate to apply driving force thereto, said coupler means being sized relative to said spacing to permit motion of said traveling nut and said follower means relative to said gate corresponding to said predetermined extent of rotational motion to said screw means without conversion to translational motion of said gate.

4,229,908

APPARATUS FOR AUTOMATIC JOINT MACHINING IN HEAVILY THICK CYLINDERS

Cesare Panzeri, Macherio, Italy, assignor to Breda Termomeccanica S.p.A., Milan, Italy

Filed Oct. 24, 1978, Ser. No. 954,202
Claims priority, application Italy, Jun. 1, 1978, 24114 A/78
Int. Cl.[3] B24B *5/40*
U.S. Cl. 51—103 R 6 Claims



1. An apparatus for the automatic machining of joints in

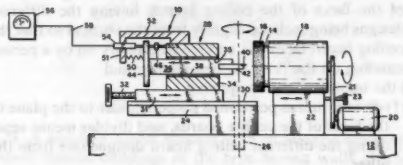
cylinders comprising a handling device, a first base structure attached to said handling device and provided with vertical guides, a first carriage slidable on the said vertical guides, a second base structure attached to said carriage and provided with horizontal guides, a second carriage slidable on said horizontal guides, a hydropneumatic device mounted on said second carriage and comprising at least one double acting pneumatic piston and cylinder assembly and a hydraulic damper, an operating head, and means attaching said operating head to said hydropneumatic device, said attaching means including means for angularly orienting said operating head relative to said second carriage about a vertical axis, said pneumatic piston and cylinder assembly having a lower chamber and an upper chamber, means for supplying said lower chamber with fluid at a first pressure to cause a fast lifting of said head, and means for supplying said upper chamber with fluid at a second pressure lower than said first pressure to annul the upward thrust while supplying said operating head with a downward operative thrust of a constant value.

4,229,909

TOOL GRINDING MACHINE

Charles E. Dial, Sr., Lenoir City, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 22, 1979, Ser. No. 22,895
Int. Cl.³ B24B *3/34*
U.S. Cl. 51—165.75 **5 Claims**



1. A tool grinding machine comprising a rotatable grinding wheel, tool holding means for holding a tool to be ground to desired tolerances, bearing means for supporting the tool holding means in a relatively movable manner therewith along a path in a single plane, pivotal means coupled to said bearing means for rotating the tool holding means over a preselected arc on an axis perpendicular to said plane and parallel to the face of the grinding wheel, moving means disposed intermediate said pivotal means and said bearing means for effecting relative displacement of said bearing means and the tool holding means supported thereby along said plane, sensing means coupled to said tool holding means for sensing said relative movement of said tool holding means within said bearing means when the tool is placed in contact with said grinding wheel by said moving means and when the tool holding means is displaced about said arc while in said contact with the grinding wheel, and spring means engaging said tool holding means for continually urging the latter along said path towards said grinding wheel.

4,229,910

KNIFE SHARPENING APPARATUS

James A. McRae, P.O. Box 21, Beatty, Oreg. 97621

Filed Dec. 6, 1978, Ser. No. 966,883
Int. Cl.³ B24D *15/08*
U.S. Cl. 51—211 H **6 Claims**

1. Knife-sharpening apparatus comprising, in operative condition,

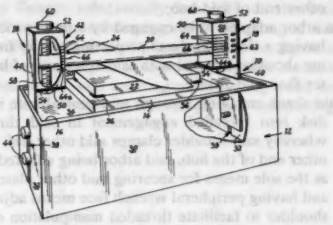
a platform supporting a sharpening stone thereon,

a bar mounted adjacent said platform,

means defining a scale of markings representing spacings between said bar and said platform measured relative to a preselected spacing,

shifting means for producing such preselected spacing between said scale-defining means and said platform, and

bar shifting means operatively interconnecting said bar and said platform, selectively operable, independent of said shifting means, to produce a desired spacing between said



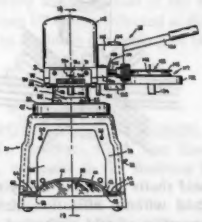
bar and said platform corresponding to a preselected one of said scale markings, wherein a knife blade placed with its working edge against said stone and its opposite edge against said bar is held at a preselected angle relative to said stone.

4,229,911

PRECISION BLOCKING OF SEMI-FINISHED LENS BLANKS

Bela J. Bicskei, 7 Hemenway Rd., Framingham, Mass. 01701

Filed Apr. 3, 1978, Ser. No. 893,078
The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—284 E **6 Claims**



1. The method of blocking a lens blank with a prescribed optical condition comprising the steps of:

(a) manually positioning a lens blank in an instrument until the prescribed optical condition has been satisfied; and

(b) affixing a block to said lens blank without moving it from its adjustment position using a plunger mechanism to bring a releasable block bearing a double-faced adhesive strip into contact with the lens blank to adhesively secure the block to the blank.

4,229,912

TAKE-APART CONVERTIBLE ROTARY TOOL

William F. Laughlin, 133 Division St., St. Charles, Ill. 60174

Filed May 30, 1978, Ser. No. 910,210
Int. Cl.³ B24D *13/04*
U.S. Cl. 51—335 **8 Claims**

1. A take-apart convertible rotary tool for working a surface by means of peripherally extending yieldable working elements, comprising:

a pair of spaced coaxial body disks of substantial diameter;

an axial hub of substantially smaller diameter than the disks and having one end permanently fixedly attached in unitary relation to the center of one of said disks, and the opposite end of said hub projecting toward the other disk;

said other disk being separably assembled with said opposite end of said hub;

said hub having a threaded bore opening through said opposite end;

said other disk having a central opening slightly larger than said threaded bore but smaller than the diameter of said other end of said hub;

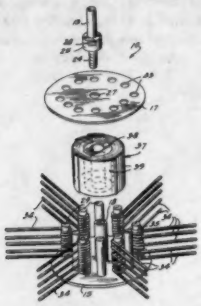
an arbor adapted to be engaged by a power tool chuck and having a threaded shank projecting axially from a clamping shoulder integral with said arbor and of larger diameter than said shank;

said shank engaging through said central hole in said other disk into threaded engagement in said threaded bore whereby said shoulder clamps said other disk toward said other end of the hub, said arbor being adapted to function as the sole means for securing said other plate to said hub and having peripheral wrench face means adjacent to said shoulder to facilitate threaded manipulation of the arbor for securing the parts of the tool together or for separating the parts of the tool from one another;

a plurality of working element supporting shafts having one of their ends permanently fixedly attached in unitary relation to said one disk at respective spaced intervals relative to each other and relative to said hub and projecting toward said other disk;

said shafts being longer than said hub;

said other disk having socket holes therein complementary in diameter to said shafts;



free ends of said shafts extending freely slidably and freely releasably and without affixation into said sockets for mutual cooperation of said shafts and said other disk so that said shafts maintain said other disk corotative with said one disk and said other disk maintains said free ends of said shafts in stable relation in the assembly and working elements mounted on said shafts will be held against escape;

said other disk being separable from said hub and said shafts by simply detaching said arbor from said hub so that said other disk is then adapted to be freely lifted away from said free ends of said shafts for attaching or removing the working elements relative to said shafts, said other disk being then adapted to be quickly replaced and the arbor shaft rethreaded into said threaded bore of the hub to refasten said other disk and the unit comprising said one disk and the unitarily attached hub and shafts;

a roll of surface finishing material comprising finishing strips secured to a tubular core, said core received about said hub between said disks and inside said shafts, said core being retained between said disks but being rotatable relative to said hub to pay the strips out between said shafts;

and stiff working elements mounted rotatably on said shafts and adapted to serve as primary surface cleaning elements, and also to serve as backing for said strips when the strips are paid out for finishing purposes.

4,229,913

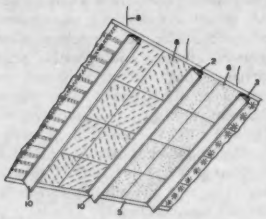
CEILING DISPLAY

James L. Corrigan, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 24, 1979, Ser. No. 69,549

Int. Cl.³ E04B *5/52*; E04F *19/02*

U.S. Cl. 52—38 **5 Claims**



1. A ceiling display unit comprising:

(a) a plurality of T-shaped runner members formed into a grid pattern, said runners having flanges adapted to support ceiling boards,

(b) a plurality of ceiling boards with different designs on the faces thereof positioned in the grid pattern of the runners,

(c) said runners and ceiling boards being suspended from structural members of a building and being positioned about 7 to 14 feet above the floor of the building, the plane of the faces of the ceiling boards having the different designs being inclined slightly from the vertical so that the ceiling board faces can be viewed directly on by a person standing on the floor of the building; and

(d) the improvement comprising

(1) divider means positioned perpendicular to the plane of the faces of the ceiling boards, said divider means separating the different ceiling board designs one from the other.

4,229,914

BUILDING STRUCTURES

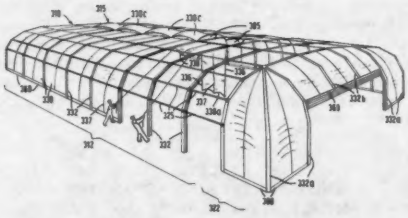
Raymond D. Lucas, "Maryland", Old Mill La., Bray-on-Thames, Berkshire, England

Filed Apr. 12, 1978, Ser. No. 895,651

Claims priority, application United Kingdom, Oct. 7, 1977, 41873/77

Int. Cl.³ E04B *1/347*

U.S. Cl. 52—63 **5 Claims**



1. A building structure comprising a plurality of arch frames disposed in vertical planes extending transversely of the building structure and spaced apart longitudinally of the building structure, each frame being provided with retainer means for longitudinal beaded edges of flexible roofing material in the form of strips, characterized in that the lengths of two of said strips are in aggregate less than that required to extend continuously along a said arch frame, said two strips are slidingly received in said retainer means of a pair of neighbouring ones

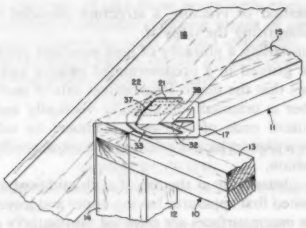
of said frames such that said two strips extend with their width dimensions directed longitudinally of the building structure across space between said pair of neighbouring frames and with their length dimensions directed transversely of the building structure in opposite directions away from a gap in the roof of the building structure between adjacent upper ends of said two strips, the bottom edges of said two strips remote from said gap are positionally fixed, and said two strips are tensioned in the direction of their length dimensions by adjustable tensioning means interconnecting the upper ends of said two strips and acting between said two strips in the general direction of their said length dimensions.

4,229,915

CORNER BRACKET WITH SADDLE FOR HIP RAFTERS OF BUILDINGS

Kenneth T. Snow, P.O. Box 175, Gilberts, Ill. 60136, and Kenneth T. Snow, Jr., 837 Price Charles La., Schaumburg, Ill. 60195

Filed Apr. 27, 1979, Ser. No. 33,816
Int. Cl.³ E04B *1/60*
U.S. Cl. 52—92 **3 Claims**



1. A building corner bracket with an integral hip saddle for wood framed buildings of the type having walls disposed at right angles to one another and forming a corner, and each wall having a top plate, said bracket comprising a horizontal plate having a portion thereof disposed over the tops of the top plates of the adjoining walls and another portion thereof extending inwardly of the corner, a first tab struck downwardly from the horizontal portion extending inwardly of the corner and adapted to abut against the inner wall of one of the wooden top plates, a second downwardly struck tab from the horizontal portion extending inwardly of the corner and disposed at right angles with respect to the first tab and adapted to abut against the inner wall of the adjoining wooden top plate, a first tab struck upwardly from the horizontal portion disposed over the tops of the top plates of the adjoining walls and a second tab struck upwardly from the horizontal portion disposed over the tops of the top plates of the adjoining walls and spaced apart from the first upwardly struck tab and lying parallel thereto, said upwardly struck tabs defining with a section of the horizontal portion between the tabs, a saddle for a hip rafter, said horizontal plate, the downwardly struck tabs and the upwardly struck tabs having nail holes for inserting nails therein to securely hold the bracket to the adjoining wooden walls and the included roof hip rafter.

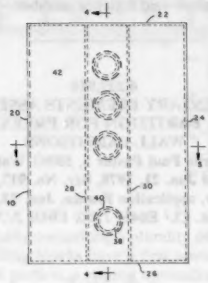
4,229,916

BUILDING PANEL

Robert W. White, 37930 Sheffield, Mt. Clemens, Mich. 48043

Filed Sep. 29, 1978, Ser. No. 946,948
Int. Cl.³ H02G *3/14*
U.S. Cl. 52—98 **6 Claims**

1. A building panel for use in conjunction with manufactured siding such as aluminum and vinyl siding which is constructed to provide a surface having a lapped siding appearance, said building panel having substantial dimensions in two mutually perpendicular directions parallel to the sides thereof, said building panel being rectangular and having a top edge, a bottom edge and two side edges, flanges extending in the same direction from one side thereof perpendicular to the building panel at the top, bottom and side edges thereof, a pair of reinforcing ribs extending in the same direction from the one side thereof perpendicular to the building panel between the top and bottom flanges substantially centrally of the building panel, said flanges and reinforcing ribs terminating in surfaces having a configuration complementary to the configuration of the manufactured siding so as to fit flush against the installed manufactured siding, said building panel having a flat surface on the side thereof opposite the flanges and reinforcing ribs



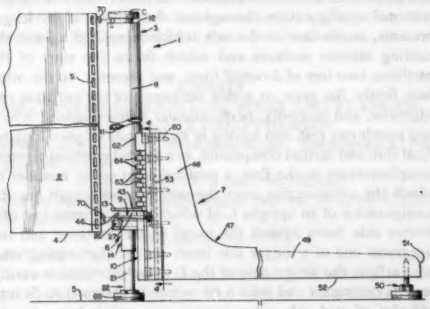
which is vertical with the building panel installed to facilitate vertical mounting of a fixture on a building structure, three spaced apart annular grooves in the surface of the one side of the building panel on the upper two-thirds thereof surrounded by annular ridges on the surface of one side of the building panel and one annular groove in the surface of the lower one-third of the one side of the building panel surrounded by an annular ridge whereby the other side of the building panel is flat and openings may be readily effected at different locations vertically thereof to facilitate connecting of the fixture on the building panel.

4,229,917

STRUT SUPPORT ASSEMBLY

Melvin A. Textoris, Struthers, Ohio, and Thomas L. Holman, Sharpsville, Pa., assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Mar. 7, 1979, Ser. No. 18,577
Int. Cl.² E04H *1/00*
U.S. Cl. 52—239 **12 Claims**



1. A strut support assembly for a partition system including, an upright having an exterior periphery terminating in a bottom edge adjacent a hollow interior, a retainer assembly partly disposed within said upright interior and extending below said bottom edge, said retainer assembly having an enlarged medial

portion and provided with a fastener receiving groove beneath said upright bottom edge and above said medial section, a strut assembly including a vertical strut support and a radially extending floor strut, said vertical strut support provided with an attachment surface having a configuration mating with that of said upright exterior periphery and said retainer assembly medial section, said strut support having fastener carrying means therein, a fastener member insertable through said fastener carrying means and encircling said retainer assembly within said fastener receiving groove to securely abut said strut assembly attachment surface against said upright periphery above said fastener member and against said retainer assembly medial section below said fastener member.

4,229,918

COMPLEMENTARY ELEMENTS ASSEMBLEABLE INTO A PARTITION FOR PREEXISTING WALL-PARTITIONS

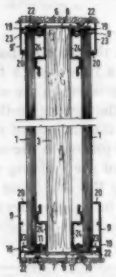
Andre Delcroix, rue Paul Pastur 5, 59391 Wattrelos, France

Filed Jun. 21, 1978, Ser. No. 917,580

Claims priority, application France, Jun. 22, 1977, 77 19698

Int. Cl.[2] E04H *1/00;* E04B *2/74*

U.S. Cl. 52—242 **13 Claims**



1. A device consisting of complementary elements for the purpose of fitting a sandwich filled or central cored type partition, having either a carrier framework or being a self supporting type and being formed by opaque, translucent or transparent flat elements, to existing interior surfaces, that is, floor, ceiling, and side walls, adjoining certain outer edges of the partition, said device comprising, as a first essential element, a sole piece section made of plastics material of which the cross-sectional configuration throughout the whole of its length presents, on its face at the side which is applied against the existing interior surfaces and which forms the start of the partition, two feet of dovetail form, and presents, on the other face, firstly, flat parts on which the panels of the partition rest edgewise, and secondly, perpendicular flanges against which said panels can rest, and having in its two side edges a longitudinal slot; and further comprising, as a second essential element complementary to the first, a profiled joint cover member of which the cross-section over the whole of its length has the configuration of an upright L of which the outermost end of a shorter side bears against the panel of the partition and the outermost end of a longer side bears against the existing interior surface, the longer side of the L being provided inwardly near its outermost end with a rib which is designed to fit into said slot of said sole piece section and which has a length considerably greater than that of the shorter side of said L, and being provided, above but adjacent to said rib, with a supplementary flange of which the extremity bears against the panel of the partition thereby limiting the extent to which said rib can enter into said slot in the sole piece section.

4,229,919

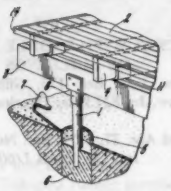
KIT OF COMPONENTS FOR INTERCONNECTING STRUCTURAL MEMBERS, AND METHOD OF UTILIZING SAME

Robert S. Hughes, Southfield, Mich., assignor to Oakwood Manufacturing, Inc., Oxford, Mich.

Continuation of Ser. No. 844,017, Oct. 20, 1977, which is a division of Ser. No. 621,789, Oct. 14, 1975, Pat. No. 4,081,940, which is a continuation of Ser. No. 372,698, Jun. 22, 1973, Pat. No. 3,921,356. This application Feb. 12, 1979, Ser. No. 11,213

Int. Cl.[3] E04B *1/343*

U.S. Cl. 52—263 **17 Claims**



1. A method of erecting a structure elevated off of the ground, comprising the steps of:

rigidly installing a plurality of post members projecting out of the ground in a predetermined pattern and in such a manner that the major longitudinal axis of each said post member is oriented substantially vertically and that the uppermost ends of said post members lie substantially within a plane which is oriented in a substantially horizontal fashion;

placing substantially at the top of each said post member an associated first apparatus having upper and lower portions whose major surfaces are oriented substantially parallel to said major longitudinal axis of the post member;

placing adjacent to said upper portion of each said first apparatus one or more structural members to form a series of substantialy parallel beams;

fastening said beams to said upper portion of said first apparatuses;

fastening at predetermined periodic spaced intervals on the top of said substantially parallel beams a plurality of second apparatuses by passing fastening means through apertures in the lowermost part of each said second apparatus and into the uppermost surface of said beams;

placing one or more structural members within each said second apparatus to form a series of substantially parallel joists which are oriented substantially perpendicular to said series of beams; and

fastening a layer of structural members on top of said joists to form the elevated structure.

4,229,920

FOAMED PLASTIC CONCRETE FORM AND CONNECTORS THEREFOR

William D. Lount, Winnipeg, Canada, assignor to Frank R. Lount & Son (1971) Ltd., Winnipeg, Canada

Filed Sep. 25, 1978, Ser. No. 945,524

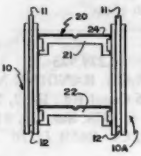
Claims priority, application United Kingdom, Oct. 5, 1977, 41420/77

Int. Cl.[3] E04B *2/32;* E04C *2/20*

U.S. Cl. 52—309.12 **6 Claims**

1. A form for concrete walls and the like comprising in combination a pair of substantially rectangular foamed plastic panels, and means to maintain said panels in spaced and parallel relationship, said means including cooperating pairs of vertically situated anchor means embedded within said panels, connector engaging means extending from each of said pair of anchor means and protruding from one face of said panels, and a connector slidably engaging upon said corresponding pairs of connector engaging means in detachable locking relationship

thereby holding said panels in the said spaced and parallel relationship, each said pair of anchor means including a base portion embedded within said panel with said connector engaging means extending therefrom, each said anchor means including an upper and lower connector engaging means situated substantially at right angles to the longitudinal axis of said panel in spaced apart relationship one above the other and spaced from the upper and lower edges of said panel by a



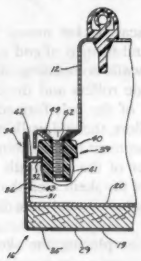
similar amount and also being spaced inwardly from the ends of said panel by a similar amount whereby said panels are interchangeable and reversible end to end, said connector including a vertically situated frame and upper and lower portions on each side of said frame operatively engaging with the corresponding connector engaging means of said anchor means, a pair of jaws on each of said connector engaging means and guide means formed on said portions of said connector slidably engageable within said jaws.

4,229,921

APPLIANCE DOOR DECORATOR PANEL CONSTRUCTION

Paul F. Schell, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Nov. 30, 1978, Ser. No. 964,840
Int. Cl.[2] E04C 1/40; A47B 43/00
U.S. Cl. 52—506 **11 Claims**



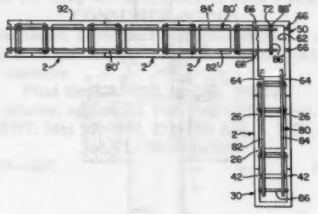
1. A decorator kit subassembly for an appliance door, the combination comprising: a support panel having lower flange means for supporting a decorator panel insert and further having rearwardly spaced generally vertically extending side flange means including an inwardly turned rear flange portion in a generally vertical plane; generally vertical side channel means on each side of said support panel having a front lip spaced from the front surface of said support panel to receive said panel insert therebetween and to retain said panel insert on said support panel, a rearwardly extending side surface, and an inwardly turned rear flange means disposed in a generally vertical plane parallel to the plane of said rear flange portion of said support panel side flange means in overlapping and generally mating contact therewith; and fastener means engaging the rear flange portion of the side flange means of said support panel and the rear flange means of said side channel means to secure said side channel means to said support panel for forming a decorator kit subassembly of said support panel and said side channel means, said fastener means including integral means to facilitate attachment of said subassembly to said appliance door.

4,229,922

WALL ASSEMBLY

John E. Clark, Jr., 735 Granvia Valmonte, Palm Springs, Calif. 92266

Filed Jun. 4, 1979, Ser. No. 45,188
Int. Cl.[3] E04C 1/10
U.S. Cl. 52—586 **7 Claims**



1. A wall assembly comprising a plurality of building blocks, each of said building blocks have a first upstanding rectangularly-shaped wall portion, a second upstanding rectangularly-shaped wall portion parallel to and coextensive with said first wall portion, and a third interconnecting said first and second wall portions, said first wall portion having first groove means on an interior surface thereof opposed to said second wall portion, said first groove means extending from an upper edge of said first wall portion toward a lower edge of said first wall portion, said second wall portion having second groove means on an interior surface thereof opposed to said first wall portion, said second groove means extending from an upper edge of said second wall portion toward a lower edge of said second wall portion, said third wall portion having third groove means in an upper edge thereof, said third groove means extending width-wise of said third wall portion upper edge, and a lattice member comprising first and second elongated runner members disposed parallel to each other and generally coextensive with each other, and spreader members, each spreader member interconnecting said runner members, the ends of said spreader members extending beyond said runner members, said spreader members being upturned at their ends to provide end portions extending substantially normal to said spreader member and extending upwardly above said runner members, said first and second groove means being adapted to receive said spreader and portions and said third groove means being adapted to receive said runner members, whereby said lattice member is adapted to interconnect and lock together said plurality of building blocks to form a wall structure.

4,229,923

METHOD OF CONNECTING PIPES AND FLANGED PIPE JOINTS USED THEREIN

Noriatsu Kojima, 5-31, Yanagishima-cho, Nakagawa-ku, Nagoya-shi, Japan

Filed Sep. 15, 1977, Ser. No. 833,410
Claims priority, application Japan, Sep. 16, 1976, 51/111213; May 31, 1977, 52/63733
Int. Cl.[2] E04B 5/48
U.S. Cl. 52—741 **2 Claims**

1. A method of assembling a pipeline in a building, which pipeline extends through floors or walls of said building, comprising:

providing pipes,

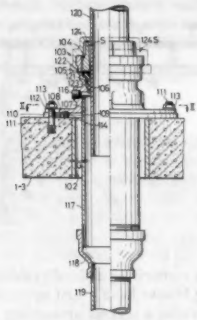
making a through-hole in a wall or floor portion of said building having a diameter larger than said pipes,

providing a pipe joint having a flange larger than said through-hole and including means for transverse adjust-

ment thereof on said wall or floor portion and for engagement by anchoring means to secure said pipe joint in a selected one of a plurality of possible positions, said pipe joint comprising means for receiving a pipe non-perpendicularly relative to the plane of the flange,

providing anchor means in said wall or floor portion in position to engage said flange when said pipe joint is positioned substantially coaxially or somewhat misaligned with said through-hole,

placing an elastic gasket on said wall or floor portion about said through-hole to accommodate tilting,



placing said pipe joint in position with the flange engaging said elastic gasket and said adjustment means of said flange being adjacent said anchor means, said pipe joint extending away from said through-hole,

securing a pipe to said pipe joint, said pipe extending in said through-hole,

effecting lateral adjustment of said pipe and pipe joint, and thereafter fixing said flange in a selected position by operation of said anchor means.

4,229,924

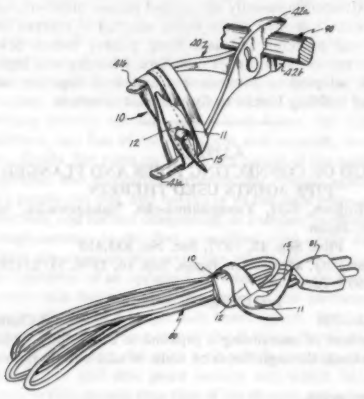
GRIPPING DEVICE AND METHOD

Donald O. Teachout, Sr., 1721 Bradford, N.E., Grand Rapids, Mich. 49503

Filed May 24, 1978, Ser. No. 896,250

Int. Cl.[3] B65B *13/02*

U.S. Cl. 53—399 **33 Claims**



19. A method for gripping articles comprising wrapping an article with an elongated flat strip of flexible, elastic material having at least 100% elasticity and having two ends, there being an enlargement relative to the lateral cross-sectional dimensions of said strip located near one end thereof, and there being an aperture in said strip located near the other end thereof, said aperture being just sufficiently large that said enlargement can be fitted therethrough, but being sufficiently small that once through said aperture, said enlargement cannot easily be pulled back through it; applying tension to said strip as it is wrapped about said article by stretching the same at least 100%, and inserting said enlargement through said aperture to hold said strip in place.

4,229,925

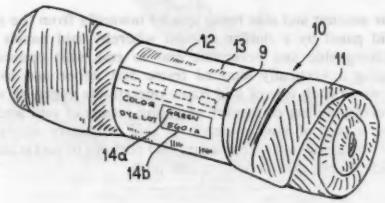
SKEIN AND BALL BANDING MACHINE

James P. Stirniman, 706 Canal Rd., Rt. 2, Minooka, Ill. 60447

Filed Jun. 6, 1978, Ser. No. 912,993

Int. Cl.[3] B65B *13/16*

U.S. Cl. 53—399 **35 Claims**



1. A banding machine system for wrapping a band around a compressible skein of material to be banded, comprising:

(a) a belt extending in a predetermined direction formed in a closed loop;

(b) first and second pocket forming guide rollers axially spaced apart from each other and transversally to said predetermined direction, portions of the belt being formed around peripheral portions of the first and second guide rollers;

(c) a partially cylindrical pocket means for receiving the skein to be banded and formed of end walls and a curved main wall, the end walls comprising end surfaces of the first and second guide rollers and the curved main wall comprising portions of the belt formed around the first and second guide rollers, the end walls being spaced sufficiently to permit placement of the skein entirely therebetween and a diameter of the end walls being less than a maximum diameter of the skein such that the skein will be compressed in the pocket means to the diameter of the end walls;

(d) skein feed means for placing the skein in the pocket means;

(e) band feed means for placing the band between the skein and the belt; and

(f) drive means for moving the belt around the pocket forming guide rollers and to thereby wrap the band around the skein with the belt remaining in substantially complete circumferential contact with the first and second guide rollers throughout the wrapping operation.

4,229,926

METHOD OF MAKING BOOKLET

Sidney Rowling, Wynnewood, Pa., assignor to Jack Seidman, Philadelphia, Pa., a part interest

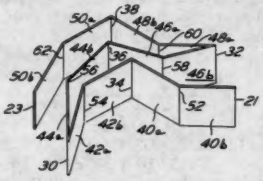
Continuation of Ser. No. 541,307, Jan. 15, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,749

Int. Cl.[1] B65B *9/02, 63/04*

U.S. Cl. 53—429 **4 Claims**

1. A method comprising the steps of printing on an elongated paper sheet in a direction parallel to the longest edge of said sheet, folding said printed sheet transversely into thirds,

said folding step being accomplished in a manner so that a third of said sheet at one end overlies one face of the middle third of the sheet and the remaining third of the sheet is juxtaposed to the opposite face of the middle third of the sheet, then folding the sheet in half, then folding the sheet in half again, to thereby provide a booket having pages of the same size without the use of fasteners and only fold lines at one end thereof, introducing the thusly folded booklet into an envelope, sealing said booklet



within said envelope, slitting the folded booklet in a direction perpendicular to said fold lines before it is introduced into the envelope so as to define a plurality of discrete booklets each having a width narrower than the width of said sheet, and producing by said folding steps a booklet having dimensions of approximately three inches in length by approximately 2¼ inches in width before introducing said booklet into said envelope.

4,229,927

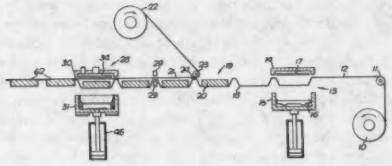
PROCESS AND APPARATUS FOR VACUUM PACKING

Timothy T. Day, London, England, assignor to J. Sainsbury Limited, London, England

Continuation-in-part of Ser. No. 799,868, May 23, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,176

Int. Cl.³ B65B *31/02, 47/02*

U.S. Cl. 53—433 **19 Claims**



1. A process for successively packing commodities into vacuum-sealed packs formed from a pair of superposed flexible films each of which comprises a laminate of two flexible layers of plastics material one dominating layer of which has a softening temperature below that of the other layer, comprising thermoforming unstretched depending pockets successively in a lower continuous web of a first film by thermoplastic deformation of but without stressing said film which has the laminate with the lower softening point on its upper surface, said thermoplastic deformation to form pockets taking place above the softening point of said dominating layer, putting a commodity to be packed into each of said unstretched thermoformed pockets, laying an upper continuous web of a second film onto the upper surface of said lower web with lower softening point layer in contact with the upper surface of the lower web in overlying relation to the pockets containing the commodities, impulse sealing said films transversely of the web between the pockets, advancing the superposed webs to a vacuum sealing and continuously heated chamber, enclosing at least one of the pockets in said chamber, hermetically sealing said chamber, heat sealing said films together around the pocket periphery leaving an opening and evacuating the interior of the chamber and the interior of the pocket and simultaneously heating above the softening point of adjacent layers of said two films within the chamber, closing said opening and sealing said pocket under vacuum and aerating the interior of the chamber to cause the heat softened films to collapse without shrinking around the commodity in the pocket, the films in the chamber being heated to a temperature above the softening point of the low melting point layers so as to cause the portions of the inner layers of the films which are in contact with each other to soften sufficiently to fuse together around the commodity on aeration of the chamber.

4,229,928

METHOD OF AND AN APPARATUS FOR PACKAGING CONSUMER GOODS

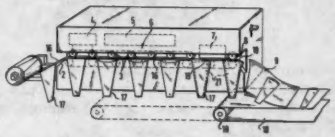
Bernd Münchinger, Talstrasse 9, 7064 Remshalden 1, and Robert Brehm, Schmölzstrasse 11, 8104 Grainau, both of Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,521

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649777; May 23, 1977, 2723173; Aug. 1, 1977, 2734644

Int. Cl.² B65B *43/06*

U.S. Cl. 53—452 **17 Claims**



1. A method of packaging goods, such as flowers, flower pots, foodstuffs, beverages, and similar consumer goods, comprising the steps of superimposing two strip-shaped thermally weldable layers; converting the layers into an elongated formation having a receptacle portion including a plurality of packaging receptacle preforms each having at least one open end, and at least one transporting portion extending along the receptacle portion and interconnecting the receptacle preforms in series, including applying heat to zones of the superimposed layers which extend from the open end of the respective receptacle preform into the receptacle portion and away from the transporting portion to thereby weld such zones of the layers to one another; advancing the transporting portion of the formation to thereby displace the receptacle preforms in a processing path; detecting the respective receptacle preform from the remainder of the receptacle portion of the formation at least at the welded zones; separating the superimposed layers of the detached receptacle preform at least at the open end thereof; introducing the goods to be packaged into the detached receptacle preform through the separated open end thereof; closing the open end of the filled receptacle preform; dissociating the closed receptacle preform from the transporting portion after said closing step, to obtain a freely transportable filled receptacle; supporting and transporting the filled receptacle preform which is dissociated from the transporting portion, by movable means; and using said movable means which supports and transports the dissociated filled receptacle preform, during said introducing step for supporting the receptacle preform.

4,229,929

THERMOPLASTIC CONTAINER

Leslie Vajtay, 107 Stanford Ave., Colonia, N.J. 07067

Filed Jun. 5, 1978, Ser. No. 912,839

Int. Cl.³ B65B *43/08*

U.S. Cl. 53—456 **3 Claims**

1. Method of forming a thermoplastic can comrpising the steps of:

providing a flattened thermoplastic sleeve at a first manufacturing location, said sleeve having at least one pair of creases;

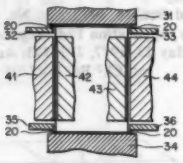
transporting said flattened thermoplastic sleeve in its flat-

tened state to a second manufacturing location, all further fabrication steps occurring at said second manufacturing location;

opening said flattened thermoplastic sleeve into a substantially round cross-sectional shape;

eliminating said at least one pair of creases by inserting said sleeve into a die having heated die portions placed adjacent said pair of creases on both the inside wall and outside wall of said sleeve and applying heat and pressure to both the inside and outside walls;

stiffening the ends of said opened thermoplastic sleeve into said substantially round cross-sectional shape by inserting said sleeve into a die having heated die portions surrounding the lip of the sleeve at each end and applying heat and



pressure to form an outwardly radiating flange that is adapted to receive a metal canning disc as an end closure at each end of the sleeve, thereby forming a stable cylindrical central section;

metallizing at least one surface of said stable cylindrical central section;

providing first and second end closures for said cylindrical central section;

joining the first end closure to said cylindricl central section, thereby sealing one end of said cylindrical central section and forming an open can;

filling said open can with desired contents; and

joining the second end closure to the other end of said cylindrical central section, thereby completing the sealing of said filled thermoplastic can.

4,229,930

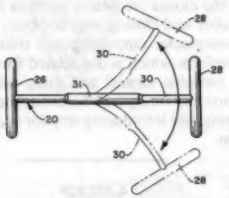
FLEXIBLE LINK FASTENER

Albert E. Ostermaier, 4710 Sunnyslope Ave., Sherman Oaks, Calif. 91403

Continuation-in-part of Ser. No. 867,728, Jan. 9, 1978, abandoned. This application Nov. 29, 1978, Ser. No. 964,771

Int. Cl.[2] **B68C** *5/00;* **B44D** *3/18*

U.S. Cl. 54—79 **5 Claims**



1. A fastening system for a horse blanket or the like comprising:

a blanket having a pair of opposing flanges and adapted to cover a horse;

said flanges adapted to come together around the horse and having a plurality of eyelets in said opposing flanges adapted to overlap to adjust the fit of said blanket;

a flexible link fastener adapted to engage and join respective eyelets in said flanges to secure said blanket;

said fastener comprising:

an elongate cylindrical flexible shaft;

a pair of substantially stiff cylindrical bars attached at each end of said flexible shaft;

said flexible shaft having a cylindrical thickened portion of at least one-half the length of the flexible shaft and narrower, more flexible end portions;

the thickened portion being at least one-and-one-half times the diameter of the end portions;

the ends of said flexible shaft being connected substantially perpendicular to the stiff bars when in an unflexed position at the mid-point of said stiff bars;

said stiff bars being passed through respective eyelets in said opposed flanges thereby securing said blanket to a horse.

4,229,931

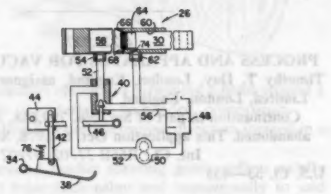
HYDRAULIC HEIGHT SENSING SYSTEM WITH CYLINDER BY-PASS

Francis E. Schlueter, Des Moines; Russell D. Copley, Ankeny, and Leon F. Sanderson, Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 811,961, Jun. 30, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,219

Int. Cl.[3] **A01D** *75/14, 45/00*

U.S. Cl. 56—10.2 **4 Claims**



1. A harvester having a main mobile frame, a harvesting unit having a forward end and a rearward end and carried on the frame for rocking movement about a transverse horizontal axis, and an improved unit height control means for rockably raising and lowering the forward end of said unit in accordance with ground surface variations including: a hydraulic fluid supply supported by the frame; a fluid supply line connected with the supply; a ground-engaging feeler mounted on the unit for vertical movement in response to ground surface variations; a hydraulic cylinder supported between the frame and unit and connected with the supply line; means in the supply line between the supply and hydraulic cylinder for creating a flow therein; a first fluid return line connected with the supply; a second fluid return line between the supply and hydraulic cylinder; a valve control mechanism connected to the first return line and the supply line and coupled with the feeler so as to be responsive to vertical movement of the feeler to adjustably vary fluid flow to the supply and hydraulic cylinder; and fluid bypass means in the hydraulic cylinder to permit fluid flow from the supply line, through the cylinder and to the second return line when the hydraulic cylinder is extended.

4,229,932

HARVESTERS

Gustaaf M. Persoons, Schoten, Belgium, and Corneel C. Wijts, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 7, 1976, Ser. No. 693,615

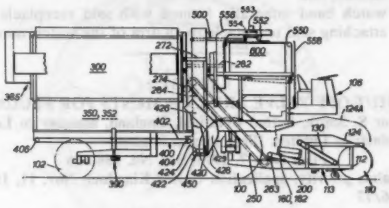
Claims priority, application United Kingdom, Jun. 13, 1975, 25310/75

Int. Cl.[3] **A01D** *45/24*

U.S. Cl. 56—13.5 **19 Claims**

1. In a pea harvester, a pick-up reel extending at least over the full width of the track of the harvester, a first conveyor of a width substantially corresponding to that of the reel and

disposed rearwardly of the pick-up reel to receive vines therefrom, transverse, second, conveyors, an upwardly-inclined, relatively narrow, third conveyor, said second conveyors being arranged to receive vines from the first conveyor and to centralize the vines to a station where they are received by the third conveyor, an elevating conveyor of a width substantially corresponding to the width of said third conveyor and arranged to convey the vines upwardly, a rotary threshing drum with its axis of rotation extending longitudinally of the harvester and disposed to receive vines from the elevating conveyor, said drum serving to thresh the peas, cleaning conveyor means running below the drum, to receive peas from the drum, a pea conveyor extending below the threshing drum arranged to receive the peas from the cleaning conveyor means and serving to convey the peas forwardly of the harvester, an elevator receiving peas from the pea conveyor, a horizontal conveyor receiving peas from the elevator, a movable endless sieve receiving peas from the elevator, and a hopper with the upper run of the movable sieve lying over an opening into the hopper and allowing only peas to fall into the hopper.

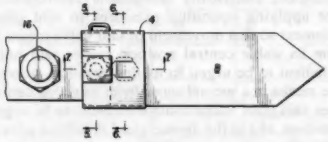


4,229,933

SEPARABLE MOWER BLADE

Roy A. Bernard, Rte. 3, Box 366, St. Martinville, La. 70582

Filed Mar. 7, 1979, Ser. No. 18,342
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **5 Claims**



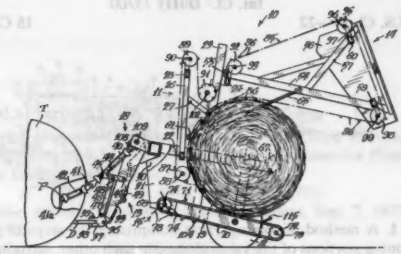
1. A blade which is separable from a stem of a mower bar in which the area of interconnection comprises a cut away slot disposed on said blade which extends to a hexagonal cut out area nearer a tip of the blade, and a bolt extending through a terminal portion of the stem having a nut with a substantially hexagonal configuration whereby said stem and said blade can be interconnected by juxtaposing the hexagonal bolt with said hexagonal cut out area, and sliding said blade outwardly so that said hexagonal bolt rides within said slot and a protective shroud means overlying the area of interconnection between said blade and said stem which further retains said blade and stem, said shroud means having a depression which resides within said hexagonal cut out area to resist relative motion of said blade and said stem.

4,229,934

BALE ROLLING MACHINE

Richard K. Berky, Cedar Falls, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,722
Int. Cl.³ A01D *37/00*
U.S. Cl. 56—341 **25 Claims**



1. Apparatus for rolling large bales of fodder comprising, in combination:

a frame which has side frame members and supporting wheels;

a floor supported by said side frame members;

hitch means at the front of the frame adapted for attachment to the draw bar of a farm tractor by means of an upright pintle;

means for tilting said floor about a transverse pivot axis between a baling position in which the front of the floor is immediately adjacent the ground, and a discharge position in which the front of the floor is raised;

endless chain fodder conveyor means extending longitudinally of the floor, said conveyor means having front and rear sprockets and lugged chains with a rearwardly moving working run on top of the floor;

rotary fodder pickup means coaxial with the front sprockets, said pickup means having tines to feed fodder from the ground onto the fodder conveying means;

a pair of raddle guiding discs journalled on the side frame members to define the sides of a baling chamber, said discs having outer plates substantially the diameter of a finished bale and inwardly projecting narrow, concentric flanges near the periphery of the plates;

a rear discharge gate pivoted on the side frame members above the axes of the discs;

a plurality of parallel endless baling raddle chains connected by raddles extending transversely above the floor, said baling raddle chains being trained over upper and lower forward sprockets journalled on the frame and over upper and lower rearward sprockets journalled on the gate, and said raddles having their extremities supported on the disc flanges so the chains and raddles have a lower working run from the lower rearward sprocket, over the discs, and down the front part of the frame and define the rear, top and front of the baling chamber;

chain take-up means including movably mounted take-up sprockets engaging the baling chains and spring means biasing said movably mounted sprockets to minimize the length of the working run of said baling chains;

means for driving the fodder conveyor means and the fodder pickup means;

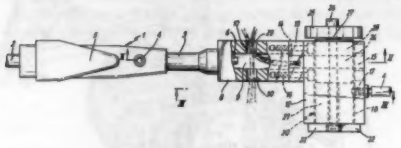
means for driving a forward sprocket to move the working run of the baling chains forwardly above the floor;

and means for swinging the rear discharge gate between a generally upright baling position and a generally horizontal elevated discharge position.

4,229,935
JOINING YARNS

John K. Wain, Little Arrow, Torver, Coniston, Cumbria, England

Filed Mar. 14, 1979, Ser. No. 20,504
Claims priority, application United Kingdom, Mar. 21, 1978, 11053/78; Apr. 11, 1978, 14129/78; Apr. 25, 1978, 16379/78; Apr. 26, 1978, 16611/78; May 2, 1978, 17167/78; Jun. 1, 1978, 26249/78
Int. Cl.[2] D01H 15/00
U.S. Cl. 57—22 15 Claims



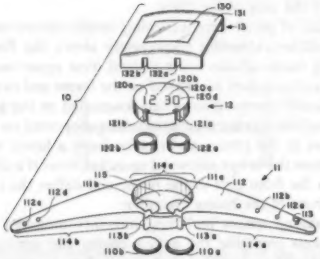
1. A method of joining yarns comprising the steps of positioning portions of the yarns alongside each other, introducing said portions into apparatus having an inlet for said portions, and exposing said yarn portions within said apparatus to a fluid flow to effect joining of said yarn portions wherein said apparatus has two passages in communication with and extending away from said inlet and the fluid flow is directed alternately along one then the other of said passages in a direction away from said inlet such as to cause said yarn portions to be drawn alternately along one then the other of said passages.

8. Yarn joining apparatus comprising a chamber with a yarn inlet thereto through which yarn portions arranged alongside each other can be introduced into the chamber, and a pressure fluid inlet to said chamber, wherein first and second passages are in communication with and extend away from said chamber, such that pressure fluid from said inlet can flow into one or the other of said passages, and diversion means is provided which is operable to effect diversion of said pressure fluid flow alternately to one then the other of said passages.

4,229,936
LOW-COST WATCH CASE AND BAND

Mark R. Schneider, San Jose, and Larry D. Wickwar, San Mateo, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 19, 1977, Ser. No. 788,866
Int. Cl.[2] G04B 37/00; G04C 3/00
U.S. Cl. 368—282 8 Claims



1. An integral watch band and case comprising:

a receptacle for receiving a watch module, said receptacle having a sidewall formed of a resilient material, said sidewall having an outside surface and an inside surface;

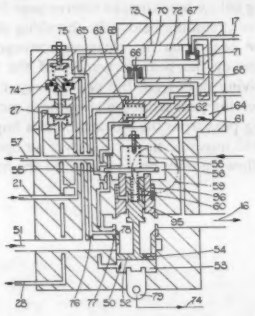
switch means located directly adjacent to M switches operable for controlling functioning of the watch module, where M is a selected positive integer, said switch means comprising N sidewall sections integrally formed with said sidewall, where N is a selected positive integer, each of said N sidewall sections (1) being thicker than the normal thickness of said sidewall, (2) having an external protuberance extending outward beyond the normal outside surface of said sidewall, and (3) having an internal protuberance extending inward beyond the normal inside surface of said sidewall, each internal protuberance being located directly adjacent to at least one of said M switches, said switch means operable for actuating at least one of said M switches in response to the watch user pressing at least one of said N sidewall sections on said outside surface; and

a watch band integrally formed with said receptacle for attaching said receptacle to an arm of the watch user.

4,229,937
SHUT-OFF VALVE ARRANGEMENTS FOR FLUIDS

Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 7, 1978, Ser. No. 958,536
Claims priority, application United Kingdom, Nov. 11, 1977, 46986/77
Int. Cl.[3] F02C 9/04
U.S. Cl. 60—39.28 R 5 Claims



1. A shut-off valve arrangement for use in a fluid regulating system comprises a shut-off valve having a control member and biasing means urging said control member to a shut position, said control member being urged against said biasing means by a first servo pressure, a first pilot valve having a fluid pressure operable control element movable between a first position in which said first servo pressure is vented, and a second position, electrically energisable centre-stable valve means for applying operating pressures to said pilot valve control element so that movement of said valve means in a first sense from its stable central position causes said pilot valve control element to be urged to its first position, movement of said valve means in a second sense from its stable central position causes said pilot valve control element to be urged to its second position, and in the de-energised condition of said valve means said pilot valve control element is maintained in the position to which it was last urged.

4,229,938
ROTARY INTERNAL COMBUSTION ENGINE

William A. Gallagher, Box 252, Lincoln, Mont. 59639

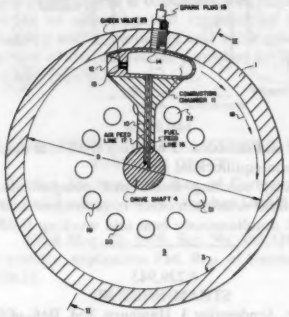
Filed Aug. 28, 1978, Ser. No. 937,322
Int. Cl.[3] F02C 5/04
U.S. Cl. 60—39.34 2 Claims

1. A rotary internal combustion engine, comprising

a cylindrical engine casing with a predetermined diameter, an axis and a width smaller than the diameter, the casing having a cylindrical interior surface;

a drive shaft coaxially rotatably mounted in the engine casing and extending out of said casing;

an arm extending radially from the drive shaft in said casing;
a combustion chamber formed in the arm in close proximity with the cylindrical interior surface of said casing and having an end with an exhaust opening therethrough, said arm having an ignition opening formed therethrough to said combustion chamber;
a spark plug mounted in said casing and in operative proximity with the ignition opening of said arm;



a fuel feed line extending through said drive shaft and said arm to said combustion chamber therein for supplying fuel to said combustion chamber; and
an air feed line extending through said drive shaft and said arm to said combustion chamber therein for supplying air to said combustion chamber whereby when the spark plug produces a spark in said combustion chamber said arm rotates and rotates said drive shaft.

4,229,939

FUEL CONTROL FOR A GAS TURBINE ENGINE REHEAT SYSTEM

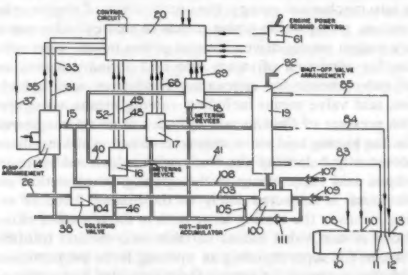
Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 22, 1979, Ser. No. 5,207

Claims priority, application United Kingdom, Feb. 17, 1978, 632578

Int. Cl.³ G05D *7/06*

U.S. Cl. 60—243 **6 Claims**



1. A fuel control for a gas turbine engine reheat system having a plurality of burners, the fuel control system comprising a plurality of metering valves for controlling fuel flow to the respective burners of the reheat system, a plurality of means for varying the effective flow areas of the respective valves, a plurality of means for detecting the pressure differentials across the respective valves, means responsive to the aforesaid detected pressure differentials, for determing the fuel flows through the respective valves, a fuel pump having an inlet throttle, means for generating a first control signal proportional to the sum of the determined fuel flows, means for generating a second control signal dependent on a pressure differential across one of said metering valves, and means responsive to said first and second control signals for controlling said pump inlet throttle.

4,229,940

HYDRAULIC MASTER CYLINDER

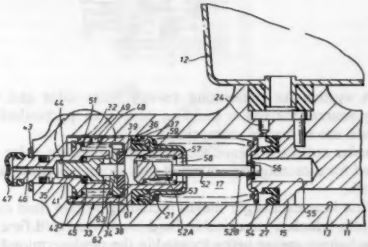
Raymond Higgerson, Bishops Itchington, and David Parsons, Kenilworth, both of England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Aug. 22, 1978, Ser. No. 935,771

Claims priority, application United Kingdom, Sep. 7, 1977, 37270/77

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **8 Claims**



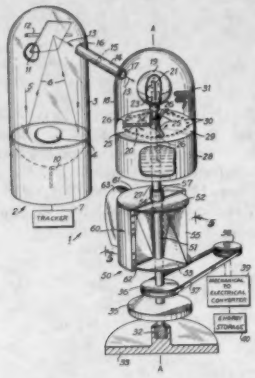
1. A master cylinder for use in a motor vehicle split hydraulic braking system having disc brakes for acting on one set of wheels and drum brakes for acting on another set of wheels, the master cylinder comprising:
a body having first and second bore portions therein;
a first piston slidable in the first bore portion;
a second piston slidable in the second bore portion;
a first chamber defined by the housing and the first piston, and which in use is pressurised by movement of the first piston in a brake-applying direction;
a second chamber defined by the housing and the second piston and which in use is pressurised by movement of the second piston in a brake-applying direction;
a first outlet port communicating with the first chamber for connection to the drum brakes;
a second outlet port communicating with the second chamber for connection to the disc brakes;
delay valve means to control flow from the second chamber to the second outlet port, said delay valve means comprising a valve member mechanically connected to one of said first and second pistons and being movable to close communication from the second chamber to the second outlet port in direct response to initial movement of said one piston away from a brake released position, a plunger movable by fluid pressure in the second chamber to reopen communication from the second chamber to the second outlet port and a control spring biassing the plunger in the opposite direction to delay such movement of the plunger until pressure in the second chamber reaches a predetermined magnitude;
and non-return valve means allowing return flow from the second port to the second chamber.

4,229,941

METHOD OF AND SYSTEM FOR GENERATING ENERGY FROM SOLAR AND WIND ENERGY SOURCES

Charles S. Hope, New York, N.Y., assignor to Solwin Industries, Inc., New York, N.Y.

Filed Jan. 25, 1978, Ser. No. 872,094
Int. Cl.[2] F03G 7/02; F03D 11/02
U.S. Cl. 60—641 14 Claims



1. A system for generating energy from solar and wind energy sources for use in building structures, particularly for domestic use in homes, comprising:

(a) solar collector means for collecting incident solar rays, and for directing the collected rays along a predetermined path;

(b) first heat exchanger means including a main fluid circuit along which a vaporizable fluid circulates, said first heat exchanger means being located in the predetermined path for exchanging heat energy with the collected solar rays therein, and for converting the vaporizable fluid in one part of the main circuit to a vaporized gas in another part thereof;

(c) means for converting the thermal energy contained in the vaporized gas to mechanical energy;

(d) wind collector means for collecting incident wind energy, and for converting the collected wind energy to mechanical energy;

(e) means for converting both the mechanical energy derived from the solar rays and the mechanical energy derived from the wind energy to electrical energy, to thereby combine the dual solar and wind energy sources into a unitary power system; and

(f) second heat exchanger means including a service circuit along which water for domestic use circulates, said second heat exchanger being also located in the predetermined path for exchanging heat energy with the collected solar rays therein, and for heating colder water in one portion of the service circuit to hotter water in another part thereof, to thereby supply heated water for domestic use in the home.

4,229,942

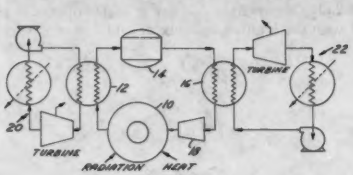
RADIOLYTIC DISSOCIATIVE GAS POWER CONVERSION CYCLES

Henry J. Gomberg; John G. Lewis, and John E. Powers, all of Ann Arbor, Mich., assignors to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Jun. 6, 1978, Ser. No. 913,017
Int. Cl.[2] G21D 5/00
U.S. Cl. 60—644 5 Claims

1. In a power cycle which includes the steps of adding heat to a working fluid at high pressure to raise said working fluid to high temperature and withdrawing heat from said working fluid at reduced pressure, the improvement wherein said step of adding heat to said working fluid comprises the steps of:

(a) chemically dissociating at least a portion of said working fluid by radiolysis at a temperature below the thermal equilibrium temperature of said dissociated working fluid



such that said dissociated working fluid is at macroscopic thermal non-equilibrium, and

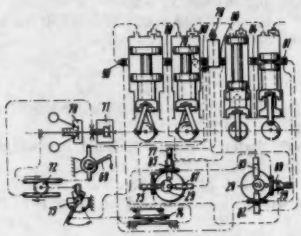
(b) chemically reacting dissociated components of said working fluid with each other to recombine said components and simultaneously heat said working fluid.

4,229,943

STEAM ENGINE

Franz Kriegler, Arndesstieg 3, Hamburg, Fed. Rep. of Germany (D-2000)

Filed Apr. 20, 1977, Ser. No. 789,343
Int. Cl.[3] F01K 13/02
U.S. Cl. 60—652 17 Claims



1. In a steam engine for conversion of all kinds of heat energy into mechanical energy; the combination of engine cylinder means; reciprocable piston means in said cylinder means; rotary output means driven by said piston means; inlet valve means for admission of steam into said cylinder means and relief valve means for evacuating fluid from said cylinder means, said valve means including valving means acted upon by the pressure of fluid in said cylinder in an opening sense; means for biasing said valve means to closed positions; means for constantly balancing the force with which said pressure acts upon said valve means in the opening sense so that said valve means is subjected solely to the biasing force of said biasing means in the closing sense both in the open and closed positions of said valve means variable-ratio motion transmitting means for superimposing an opening force proportionate to said pressure upon the biasing force furnished by the respective biasing means so that the action of the latter upon said valving means prevails over that of said pressure at selected values thereof, including selector means movable to a plurality of positions for varying the pressure of steam which is admitted into said cylinder means by way of said inlet valve means and means controlled by said selector means and operative for opening said valve means and for simultaneously changing the degree of filling of said cylinder means with steam in dependence on the position of said selector means; condenser means; pump means; regulating means for relating the pressure in said condenser means to the operation of said pump means so as to achieve an optimum thermal efficiency by raising the conden-

sation point to a maximum or to achieve maximum output by lowering said point to a minimum; and means for controlling the operation of said transmitting means, including speed-responsive governor means for indicating the speed of the engine, torque-responsive regulator means for indicating the output torque of the engine, and transmission and switching means interposed between said regulator and governor means and said transmitting means, and operative for changing the performance of the engine in dependency on the instantaneous conditions by so adjusting said transmitting means as to achieve opening and/or closing of said valve means as a combined function of the indications furnished by said governor means and said regulator means.

4,229,944

FUEL INJECTION NOZZLE ASSEMBLY FOR GAS TURBINE DRIVE

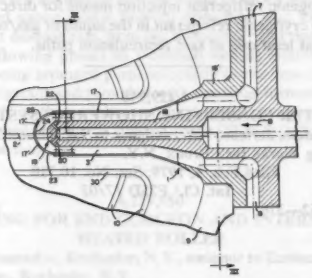
Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,189

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710618

Int. Cl.³ F02C 7/22

U.S. Cl. 60—740 **4 Claims**



1. A fuel injection nozzle assembly for gas turbine drives of the type having at least one heat exchanger for heating the combustion air, and a fuel injection nozzle which includes an annular conduit that runs coaxially to the longitudinal axis of the nozzle between an outer shielding wall and a sleeve-like central body having a passage for fuel supply, said annular conduit being ventilated by cool air that is not heated by the heat exchanger, characterized by the combination of the following features:

(a) the fuel injection nozzle is confined in a structural part that is integrated in the engine housing, forming part of an outer housing of a combustion chamber, and from there the nozzle extends via a primary air supply bore in a back wall of a flame tube, into a primary zone of the combustion chamber;

(b) the ventilated annular conduit of the injection nozzle is connected directly to a compressor end of the turbine drive and said central fuel supply passage is connected with a frontal section of the annular conduit via fuel supply bores in an injection head, and also with the primary zone by means of intake openings in the shielding wall;

(c) the central body for fuel supply engages the outer shielding wall exclusively via localized contact surfaces on the ends of cross-pieces protruding radially from the central body and located in the region of the injection head and said engine housing integrated structural part; and

(d) wherein said outer shielding member is formed of a material having the high temperature resistivity and low thermal conductivity of nickel alloys, and said central body is formed of a material having the high thermal conductivity of a copper alloy, whereby heat will be caused to flow from the injection head to the engine housing so as to act to prevent fuel carbonization.

4,229,945

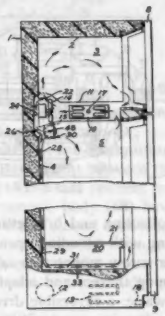
HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL AND METHOD

James R. Griffin, and Raymond M. Schreck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 8, 1978, Ser. No. 967,743

Int. Cl.³ F25D 17/06

U.S. Cl. 62—229 **6 Claims**



1. In a refrigerator having a freezer compartment on top and a fresh food compartment below the freezer compartment and being separated by a partition, an air flow system comprising:

(a) an air duct connecting the freezer compartment and the fresh food compartment to introduce a stream of cold air into the fresh food compartment,

(b) a temperature sensing element located at the top of the fresh food compartment and shielded from the stream of cold air being directed into the fresh food compartment, said temperature sensing element being utilized to change the temperature in both the freezer and fresh food compartments without changing the constant ratio of those respective compartment temperatures,

(c) an air flow control assembly to divide the stream of cold air entering the fresh food compartment between the top of the compartment and the bottom, the assembly including:

(i) a chamber for receiving the stream of cold air,

(ii) a first opening for directing a portion of the stream of cold air into the top of the fresh food compartment,

(iii) a first air passage from the chamber to the first opening,

(iv) a second opening for directing a portion of the stream of cold air downwardly into the bottom of the fresh food compartment,

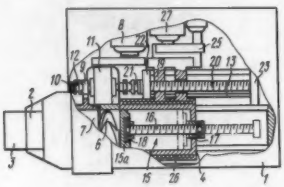
(v) a second air passage from the chamber to the second opening,

(vi) an air flow control having first and second dampers and means for rotating the dampers in unison, the dampers being spaced from each other such that when the first damper blocks the first air passage, the second damper blocks the second air passage, whereby rotation of the dampers will divide the cold air stream being directed to the first and second openings and change the ratio of the temperatures in the freezer and fresh food compartments.

4,229,946
PLANT FOR COLLECTING AND BRIQUETTING DOMESTIC WASTE

Valentin N. Slavinsky, prospekt Shvernika, 10, kv. 101; Genrikh V. Bairon, Kolpino, ulitsa Proletarskaya, 131, kv. 77, both of Leningrad; Adolf M. Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8, Moscow; Gennady M. Alexeev, Sredny prospekt, 61, kv. 55, Leningrad; Vladimir M. Matveev, Staro-Orlovskaya, ulitsa, 35, kv. 1, Leningrad; Oleg D. Minin, ulitsa Basseinaya, 105, korpus 1, kv. 355, Leningrad; Jury A. Tsimbler, Sojuzny prospekt, 10, kv. 26, Moscow; Vladimir A. Vasiliev, Moskovsky prospekt, 125, kv. 40, and Gennady B. Provalsky, ulitsa Gastello, 10, kv. 31, both of Leningrad, all of U.S.S.R.

Filed Nov. 6, 1978, Ser. No. 958,265
Int. Cl.[2] F25C *5/14*
U.S. Cl. 62—341 **5 Claims**



5. A plant for collecting and briquetting domestic waste, comprising: a housing with a loading opening and a discharge opening; a conveyer screw mounted in said housing adjacent to the loading opening thereof and adapted to advance and compact domestic waste; a reversible drive operatively connected to said conveyer screw; a chamber for forming domestic waste into briquettes, mounted in said housing adjacent to the discharge opening thereof, coaxially with said conveyer screw and adjoining the latter at one of the end faces thereof; abutment means mounted in said chamber and spanning the cross-sectional area thereof; said abutment means being mounted in said chamber for motion therealong from a first position to a second position independently of said chamber under the action of domestic waste being formed into a briquette and which is being advanced by the rotation of said conveyer screw; said chamber being mounted in said housing for axial reciprocation from a first position to a second position independently of said abutment means to release a briquette upon its having been formed and from said second position to said first position together with said abutment means; and means for effecting reciprocation of said chamber whereby upon said chamber moving together with said abutment means from said second position to said first position, said abutment means also moves from its second position to its first position.

4,229,947
CRYOGENIC FREEZER

David J. Klee, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 6, 1979, Ser. No. 64,234
Int. Cl.[3] F25D *17/02*
U.S. Cl. 62—374 **12 Claims**

1. A cryogenic freezer comprising:

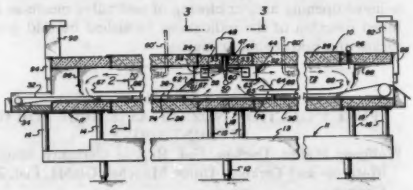
(a) at least one elongated, thermally insulated tunnel section having a product inlet and a product outlet spaced apart by at least 15 feet;

(b) horizontally disposed divider baffle means extending substantially throughout said tunnel section between said inlet and said outlet for dividing said tunnel into a pair of elongated upper plenum chambers and a pair of elongated lower product contact chambers;

(c) a single blower mounted in substantially the mid-portion of said tunnel, said blower having discharge passage means connected to said plenum chambers and inlet passage means connected to said product contact chambers;

(d) a porous conveyor belt having at least the upper reach thereof extending through said product contact chambers, means supporting said upper reach so as to form refrigerant flow paths extending above and below said reach within said product contact chambers;

(e) flow reversing passage means connecting said plenum



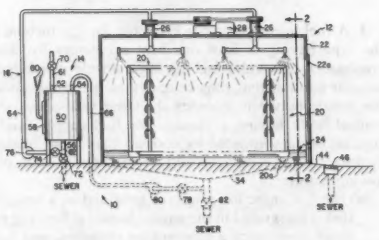
chambers to said product contact chambers adjacent the inlet and outlet portions of said tunnel section for passing refrigerant from said plenum chambers to and through said product contact chambers and back to said blower inlet passage means to form two high velocity refrigerant recirculation paths; and

(f) cryogenic refrigerant injection means for directly injecting a cryogenic refrigerant in the liquid or gas/solid phase into at least one of said recirculation paths.

4,229,948
WATER CONSERVING SHOWERING SYSTEM

Erwin Waters, Jericho, N.Y., assignor to S & F Sheet Metal and Welding Works Inc., Bronx, N.Y.

Filed Feb. 9, 1979, Ser. No. 10,710
Int. Cl.[3] F25D *17/02*
U.S. Cl. 62—376 **13 Claims**



1. In a system for cooling a food product with a showering apparatus providing a stream of coolant, a showering cabinet adapted to receive a quantity of said product on a rack for cooling and to achieve recirculation of said coolant without contamination thereof, said cabinet comprising:

collection means, defining part of a floor for said cabinet, for receiving coolant which has not come in contact with contaminated portions of said rack and said cabinet, said collection means being connected to provide coolant for recirculation to said showering apparatus, and

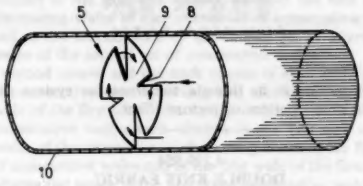
diverting means, defining part of a floor for said cabinet, for receiving coolant which has come in contact with contaminated portions of said rack, said diverting means being connected to divert contaminated coolant for disposal, said diverting means being lower in position than that portion of said collection means which first receives coolant.

4,229,949

REFRIGERATION SYSTEM

Tore Brandin, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Jan. 31, 1979, Ser. No. 8,174
Claims priority, application Sweden, Feb. 7, 1978, 7801379
Int. Cl.[3] F25B 43/00
U.S. Cl. 62—503 1 Claim



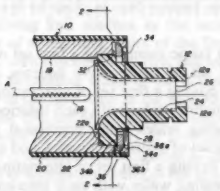
1. In a refrigeration system, the combination of a series of elements interconnected in a circuit, said elements comprising a compressor, a condenser, an expansion valve and an evaporator, a refrigerant enclosed in said circuit and adapted to flow through the circuit, said evaporator being operable to discharge the refrigerant toward the compressor as a two-phase flow which is a mixture of flowing liquid particles and flowing superheated vapor, and a flowing disturbing disc located in said circuit downstream from the evaporator and operable to give said flowing phases an increased mutual relative speed, said disc being arranged perpendicularly to the flow direction of the refrigerant and provided with openings formed by cuts extending from the periphery of the disc and dividing the disc into flaps, said flaps being twisted about 45° to form baffles for guiding the flow.

4,229,950

COUPLING FOR END GUDGEON AND INTERNALLY HEATED ROLLER

John R. Fessenden, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1979, Ser. No. 16,869
Int. Cl.[3] A42B 3/00
U.S. Cl. 64—5 10 Claims



1. A heated rotatable member comprising:

a core having a surface including a first wall and a second wall spaced from and angularly disposed relative to said first wall for defining a groove in said surface;

drive means mounted in juxtaposition with said groove for supporting and rotating said core, the coefficient of thermal expansion of said drive means being different from that of said core; and

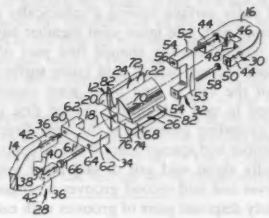
means for compensating for unequal thermal expansion and contraction of said drive means and said core, said compensating means having a first portion engaging said drive means to provide support for and rotation of said core by said drive means, and a second portion extending at least partially into said groove spaced from said first wall and in slidable engagement with said second wall to accommodate for movement between said drive means and core resulting from said unequal thermal expansion and contraction.

4,229,951

FLEXIBLE COUPLING

Daniel M. Jedlicka, Bloomington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1978, Ser. No. 939,640
Int. Cl.[3] F16D 3/64
U.S. Cl. 64—14 6 Claims



1. A flexible coupling (10) for connecting first and second shaft members (14,16), comprising:

resilient body means (12) for transmitting torque and compensating for misalignment between the first and second shaft members (14,16), said resilient body means (12) including an elastomeric body (68) having a central axis (18), opposite first and second ends (20,22), and a plurality of reinforcement members (86) arranged within the elastomeric body (68), each reinforcement member (86) being oriented in a direction substantially parallel to the axis (18);

first arms means (28) for connecting the first shaft member (14) interlockingly to said resilient body means (12) at said first end (20);

second arm means (30) for connecting the second shaft member (16) interlockingly to said resilient body means (12) at said second end (22);

first retaining means (32) for releasably coupling said resilient body means (12) to said first arm means (28) at said second end (22); and

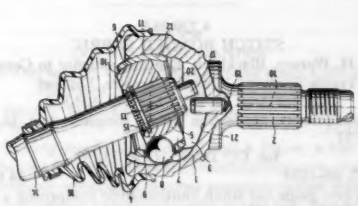
second retaining means (34) for releasably coupling said resilient body means (12) to said second arm means (30) at said first end (20).

4,229,952

HOMOKINETIC UNIVERSAL JOINT

Erich Aucktor, Offenbach, and Wolfgang Rubin, Hanau, both of Fed. Rep. of Germany, assignors to Lohr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 13, 1979, Ser. No. 11,945
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807921
Int. Cl.[3] F16D 3/30, 3/02, 3/16, 3/50
U.S. Cl. 64—21 2 Claims



1. A homokinetic universal joint comprising an outer joint

member having a hollow space defined by an inner surface with a first part of said inner surface being spherically shaped, said hollow space having an axis laterally enclosed by the spherically shaped first part of said inner surface, said inner surface having a second part extending transversely of the axis of said inner space, first grooves formed in said first part of said inner surface and extending in the direction of the axis of said hollow space and spaced apart in the direction extending circumferentially around said axis, an inner joint member positioned within said hollow space and having an outer surface spaced inwardly from said inner surface of said outer joint member, said outer surface having a spherically shaped first part and a second part, said inner joint member having an axis encircled by said spherically shaped first part of said outer surface and said second part of said outer surface extending transversely of the axis of said inner joint member, second grooves formed in said spherically shaped first part of said outer surface extending generally in the axial direction of said inner joint member and spaced apart in the direction extending circumferentially about said axis of said inner joint member, said first grooves and said second grooves arranged in a number of oppositely disposed pairs of grooves with each said pair containing one said first groove and one said second groove, a plurality of balls located between said outer joint member and said inner joint member with each ball seated in one pair of said grooves for transmitting torque between said outer and inner joint members, a cage located between the outer surface of said inner joint member and the inner surface of said outer joint member and having a plurality of openings therein for each said ball for holding the balls between said inner and outer joint members, said cage having a spherically shaped outer surface and a spherically shaped inner surface with the outer and inner surfaces thereof being concentric, the radially outer surface of said cage being guided on the spherically shaped first part of said inner surface of said outer joint member and the spherically shaped inner surface of said cage being guided on the spherically shaped first part of said outer surface of said inner joint member, the radii of said spherically shaped surfaces on said outer joint member, said cage and said inner joint member and the generating radii of said grooves in said inner and outer joint members having a common center point, wherein the improvement comprises that said inner joint member comprises a first check pin located on said second part of said outer surface thereof and facing toward said second part of said inner surface of said outer joint member, said first check pin extending along the axis of said inner joint member, said outer joint member comprises a second check pin located on said second part of said inner surface of said outer joint member and facing toward said first check pin on said inner joint member, said second check pin extending along the axis of said outer joint member and the combined axial length of said first and second check pins being greater than the dimension between the facing second parts of said inner joint member and said outer joint member when the axes of said inner and outer joint members are in alignment, so that the axes of said inner and outer joint member are maintained in oblique axial relationship.

4,229,953

STITCH BONDED FABRIC

David H. Warsop, Blackburn, England, assignor to Cosmopolitan Textile Company Limited, Cheshire, England

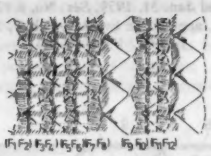
Filed Aug. 15, 1978, Ser. No. 933,843

Claims priority, application United Kingdom, Aug. 16, 1977, 34268/77

Int. Cl.[2] **D04B** *23/08, 23/10*

U.S. Cl. 66—193 **14 Claims**

1. A two guide bar stitch knitted fabric comprising a filling and front and back bar warp thread systems of which the front bar system comprises pillar stitches, characterised in that the back bar system repeats over not less than four courses, its threads passing between at least two wales of the front bar system, and comprises fewer stitches in a repeat than the number of courses in a repeat, the back bar system distorting,



through tension in its threads, the front bar system and/or filling to give a pattern or texture effect.

4,229,954

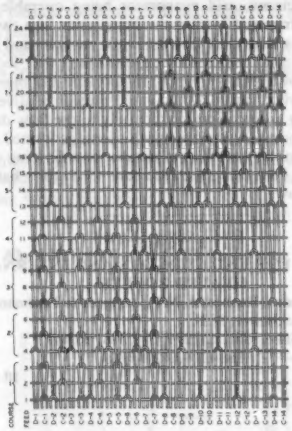
DOUBLE KNIT FABRIC

James H. Blore, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 7, 1978, Ser. No. 967,455

Int. Cl.[2] **D04B** *21/00*

U.S. Cl. 66—196 **5 Claims**



1. A double knit fabric comprising a first set of consecutive courses, a second set of consecutive courses, a first set of consecutive wales having a first set of alternating wales and a second set of alternating wales with each interior wale of said first set of alternating wales being positioned between two wales of the second set of alternating wales, and a second set of consecutive wales having a first set of alternating wales and a second set of alternating wales with each interior wale of said first set of alternating wales being positioned between two wales of said second set of alternating wales, wherein the first set of alternating wales of the first and second sets of consecutive wales form the face side of said fabric and the second set of alternating wales of the first and second sets of consecutive wales form the reverse side of said fabric;

said fabric having a repeat pattern of at least one first set of consecutive courses followed by at least one second set of consecutive courses and a first set of consecutive wales followed by a second set of consecutive wales, each said first and second sets of alternating wales of said first set of consecutive wales containing at least two wales and each said first and second sets of alternating wales of said second set of consecutive wales containing at least two wales;

each said first set of consecutive courses comprising consecutively first, second, third, fourth, fifth and sixth courses;

the first course of each said first set of consecutive courses

having knit stitches in the first wale of the first set of alternating wales of the first set of consecutive wales and in the second wale of the second set of alternating wales of the first set of consecutive wales, welt stitches in the first wale of the second set of alternating wales of the first set of consecutive wales and in the second wale of the first set of alternating wales of the first set of consecutive wales, knit stitches in the first wale of the second set of alternating wales of the second set of consecutive wales, and welt stitches in the first and second wales of the first set of alternating wales of the second set of consecutive wales and in the second wale of the second set of alternating wales of the second set of consecutive wales;

the second course and the sixth course of each said first set of consecutive courses having knit stitches in the second wale of the first set of alternating wales of the first set of consecutive wales, welt stitches in the first and second wales of the second set of alternating wales of the first set of consecutive wales and in the first wale of the first set of alternating wales of the first set of consecutive wales, and welt stitches in the first and second wales of each of the first set of alternating wales and the second set of alternating wales of the second set of consecutive wales;

the third and fifth courses of each of said first set of consecutive courses having knit stitches in the first wale of the first set of alternating wales of the first set of consecutive wales, welt stitches in the second wale of the first set of alternating wales of the first set of consecutive wales and in the first and second wales of the second set of alternating wales of the first set of consecutive wales, and welt stitches in the first and second wales of each of the first set of alternating wales and the second set of alternating wales of the second set of consecutive wales;

the fourth course of the first set of consecutive courses having knit stitches in the second wale of the first set of alternating wales of the first set of consecutive wales and in the first wale of the second set of alternating wales of the first set of consecutive wales, knit stitches in the second wale of the second set of alternating wales of the second set of consecutive wales, and welt stitches in the first and second wales of the first set of alternating wales of the second set of consecutive wales and in the first wale of the second set of alternating wales of the second set of consecutive wales;

each said second set of consecutive courses comprising consecutively first, second, third, fourth, fifth and sixth courses;

the first course of each of said second set of consecutive courses having knit stitches in the second wale of the second set of alternating wales of the first set of consecutive wales, welt stitches in the first and second wales of the first set of alternating wales of the first set of consecutive wales and in the first wale of the second set of alternating wales of the first set of consecutive wales, knit stitches in the first wale of the first set of alternating wales of the second set of consecutive wales and in the first wale of the second set of alternating wales of the second set of consecutive wales, and welt stitches in the second wale of the first set of alternating wales of the second set of consecutive wales and in the second wale of the second set of alternating wales of the second set of consecutive wales;

the second course and the sixth course of each of said second set of consecutive courses having welt stitches in the first and second wales of each of the first and second sets of alternating wales of the first set of consecutive wales, knit stitches in the second wale of the second set of alternating wales of the second set of consecutive wales, and welt stitches in the first and second wales of the second set of alternating wales of the second set of consecutive wales and in the first wale of the first set of alternating wales of the second set of consecutive wales;

the third course and the fifth course of each of said second set of consecutive courses having welt stitches in the first and second wales of each of the first and second sets of alternating wales of the first set of consecutive wales, knit stitches in the first wale of the first set of alternating wales of the second set of consecutive wales, and welt stitches in the second wale of the first set of alternating wales of the second set of consecutive wales and in the first and second wales of the second set of alternating wales of the second set of consecutive wales; and

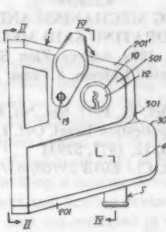
the fourth course of each of said second sets of consecutive courses having knit stitches in the first wale of the second set of alternating wales of the first set of consecutive wales, welt stitches in the first and second wales of the first set of alternating wales of the first set of consecutive wales and in the second wale of the second set of alternating wales of the first set of consecutive wales, knit stitches in the second wale of the first set of alternating wales of the second set of consecutive wales and in the second wale of the second set of alternating wales of the second set of consecutive wales, and welt stitches in the first wale of the first set of alternating wales of the second set of consecutive wales and in the first wale of the second set of alternating wales of the second set of consecutive wales.

4,229,955

LOCK FOR ROLLER SHUTTERS

Giorgio V. Coralli, and Alessandro Brunelli, both of Bologna, Italy, assignors to Viro Innocenti S.p.A., Zola Predosa, Italy

Filed Sep. 28, 1978, Ser. No. 946,693
Claims priority, application Italy, Oct. 3, 1977, 15219/77[U]
Int. Cl.³ E05B *67/36*
U.S. Cl. 70—32 **2 Claims**



1. In a roller shutter lock of a type including a body, a bolt slidably situated in the body for engagement with an anchoring ring secured to a threshold, and a key cylinder for locking said bolt, the improvement comprising a hood-shaped body having a rear flat surface attached to an outer side of the roller shutter, two side surfaces which converge upwardly and outwardly from the outer side of the roller shutter, an upper surface having at least a portion inclined downwardly, and a flat bottom surface, said body including a cavity extending from the bottom surface thereof to receive the anchoring ring therein when the shutter is closed, said bolt extending laterally across the cavity and said key cylinder being situated vertically to lock or unlock the bolt directly.

4,229,956

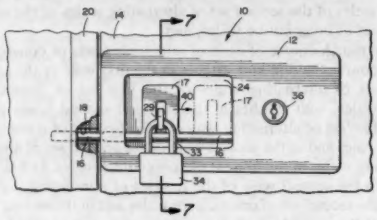
LOCKING MECHANISM

Maxwell Thorburn, P. O. Box 707, Clearlake Oaks, Calif. 95423

Filed Dec. 26, 1978, Ser. No. 973,038
Int. Cl.³ E05B *63/14*; E05C *1/02, 5/02, 13/02*
U.S. Cl. 70—129 **11 Claims**

1. A locking mechanism comprising: a frame, a bolt supported on said frame for slidable movements between extended and withdrawn positions, a member mounted on said frame for slidable movements generally parallel to said bolt, first locking means for releasably connecting said bolt to said member, said bolt being movable together with said member when said first locking means is engaged, second locking means for releasably positioning said member with respect to said frame so as to

restrict slidable movements thereof, said first and second locking means cooperating with securing means engagable with



said first locking means, and in which engagement of said securing means prevents release of said first locking means.

4,229,957

LOCKING MECHANISM AND LOCKS INCORPORATING SAID MECHANISM

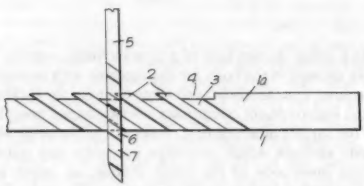
Moshe Schneerson, 189a Assirey Zion Str., Kiriyat Sharet, Raanana, and Anatoli Kofman, 8 Tamar St., Neve Monoson, both of Israel

Filed Oct. 11, 1977, Ser. No. 840,800

Claims priority, application Israel, Oct. 11, 1976, 50660; Aug. 29, 1977, 52849; Sep. 12, 1977, 52931

Int. Cl.[2] **E05B** *29/08, 65/06*

U.S. Cl. 70—134 **22 Claims**



1. A locking mechanism having at least one locking bolt supported for guided linear movement in a housing between locked and unlocked positions, said mechanism being characterized in that said locking bolt is comprised by at least two superposed bolt parts which are linearly movable along the longitudinal axis of the bolt relative to each other and are provided on the corresponding longitudinal edges thereof with a plurality of spaced matching teeth at an angle of 10°–80°, a key adapted for guided linear movement through a key-hole perpendicular to said bolt parts and having teeth matching those in the bolt parts formed in at least one of its side edges at a matching angle, the movement of the bolt parts being effected by the meshing of their teeth with those of the key upon insertion of the key in a manner such that one of the bolt parts moves linearly along the longitudinal axis of the bolt with continued insertion of the key until its teeth become aligned with the teeth in the other bolt part at which point both bolt parts move together as a single locking bolt between locking and unlocking positions.

4,229,958

CONTROL DEVICE PARTICULARLY FOR USE IN A LOCK

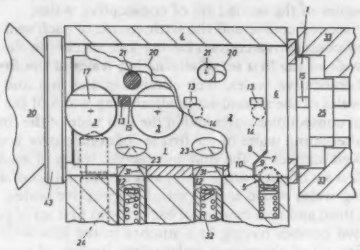
Alfred Burger, and Adalbert Paar, both of Vienna, Austria, assignors to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschlössern GmbH & Co., Vienna, Austria

Filed Mar. 2, 1979, Ser. No. 16,892

Claims priority, application Austria, Mar. 6, 1978, 1574/78; Mar. 15, 1978, 1839/78

Int. Cl.[3] **E05B** *28/00, 47/00*

U.S. Cl. 70—366 **12 Claims**



1. A control device, particularly for use in connection with a lock, comprising a tubular housing eventually having in its inner wall a first arresting recess; a plug disposed for rotation in said housing and having on its outer surface a second arresting recess; at least one magnetic rotary member arranged in said plug for rotation about an axis transverse to the center axis of the plug and defining on its surface a third arresting recess alignable with said second arresting recess; a sleeve arranged for rotation and for an axial displacement between said housing and said plug; and arresting elements connected to said sleeve and arranged for selectively engaging said recesses.

4,229,959

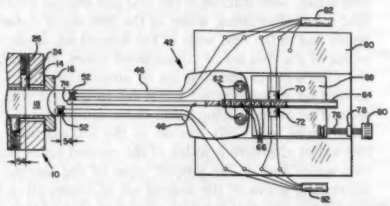
METHOD AND APPARATUS FOR OPENING A LOCK

Thomas E. Easley, 1303 Fourth St., LaGrande, Oreg. 97850

Continuation-in-part of Ser. No. 928,232, Jul. 26, 1978, abandoned. This application Mar. 30, 1979, Ser. No. 25,402

Int. Cl.[3] **E05B** *19/20*

U.S. Cl. 70—394 **15 Claims**



1. A lock pick apparatus for opening a cylinder lock of the type having an outer cylinder, a rotatable inner cylinder disposed within the outer cylinder for opening the lock upon rotation, one or more magnetic pins disposed within one said cylinder for engaging the other said cylinder to prevent said inner cylinder from rotating, and a keyway within the inner cylinder for insertion of a magnetic key to displace each pin and release the inner cylinder, thereby opening said lock, said apparatus comprising:

(a) means for determining the position and polarity orientation of each said pin by detecting the magnetic field produced thereby; and

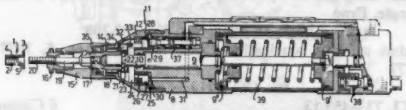
(b) means for selectively displacing each said pin so that said inner cylinder may be rotated to open said lock.

4,229,960

TOOL FOR INSTALLING SO-CALLED PRESS NUTS

Sven R. Nilsson, Lindesberg, Sweden, assignor to Lindova Aktiebolag, Lindesberg, Sweden

Filed Dec. 8, 1978, Ser. No. 967,788
Claims priority, application Sweden, Dec. 9, 1977, 7714022
Int. Cl.[3] B21J *15/34*
U.S. Cl. 72—114 6 Claims



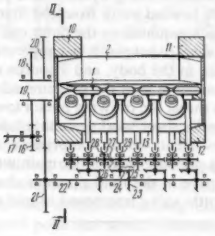
1. In a tool for the installation of so-called press nuts, in which the tool has a housing, a draw bar arranged in the housing for axial displacement, one end of said draw bar being operatively connected to a draw mandrel which extends out of the housing through a nose sleeve arranged thereon and in which a protruding end portion of the draw mandrel is provided with a thread for threadable engagement with said press nut, the improvement comprising means for connecting said draw mandrel to said draw bar so that the draw mandrel is axially immovably connected relative to said draw bar but is rotatable relative to said draw bar, a turbine wheel or the like that is journalled in said housing around said draw bar at the end thereof connected to the draw mandrel for rotation in either direction, means for rotating said turbine wheel in either direction and for bringing the turbine wheel into operative engagement with said rotatable draw mandrel to thereby rotate the draw mandrel and bring it into and out of threaded engagement with said press nut.

4,229,961

CONTINUOUS MILL

Vladimir N. Vydrin, ulitsa Timiryazeva, 28-27; Valery V. Pastukhov, ulitsa Stalevarov, 28a, kv. 79; Leonid A. Barkov, ulitsa Klary Tsetkin, 30a, kv. 13, and Vladimir S. Sysoev, ulitsa Artilleriiskaya, 65 B, kv. 6, all of Chelyabinsk, U.S.S.R.

Filed Feb. 7, 1979, Ser. No. 10,310
Int. Cl.[3] B21B *1/18, 13/12*
U.S. Cl. 72—235 4 Claims



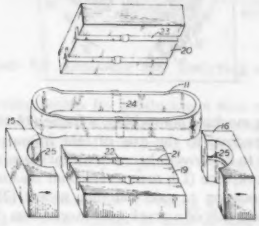
1. A continuous multi-pass rolling mill having a plurality of work rolls per pass, with the work rolls in successive passes being mutually angularly displaced, wherein said work rolls are mounted on chocks extending lengthwise of the mill, the number of chocks being equal to the number of work rolls in each pass, each chock having a pair of opposed convergent sides extending lengthwise of the mill, said sides defining an angle therebetween equal to the displacement angle between successive work roll passes, each chock carrying one work roll for each pass of the mill and the work rolls for successive passes being arranged alternatively on said opposed sides of each chock in mutually staggered relationship lengthwise of the chock.

4,229,962

METHOD FOR RECONDITIONING RIVETLESS CHAIN LINKS

William Tunderman, 18529 First Ave. - P.O. Box 65, Barstow, Ill. 61236

Filed Jun. 8, 1979, Ser. No. 46,770
Int. Cl.[3] B21L *15/00*
U.S. Cl. 72—342 3 Claims



1. The method of reconditioning similar oblong chain links of a worn chain comprising the following steps:

(1) disassembling said worn chain links from said chain for reconditioning said chain links individually,

(2) providing a support to hold said chain links individually, positioning one of said chain links to be reconditioned in said support, providing a heating device positioned relative to said support, said heating device being operable to provide intense heat concentrated in designated central opposite portions of said one chain link positioned in said support,

(3) operating said heating device to apply heat simultaneously to said central opposite portions of the sides of said one chain link, the application of heat being concentrated over short longitudinal distances of the sides and being of such intensity and short duration to heat said central portions throughout to a required temperature for reforming said portions with moderate longitudinal force while maintaining both ends of said one chain link at a relatively lower temperature to preserve the hardness thereof,

(4) providing a compressing member at each end of said one chain link, said compressing members being aligned with said one chain link in a direction to provide longitudinal inward forces within said sides thereof, each of said compressing members having a formed end adjacent a respective end of said one chain link, each of said formed ends contoured to fit precisely said adjacent end of said one chain link,

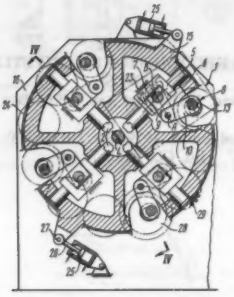
(5) moving at least one of said compressing members inwardly to position said compressing members against said respective ends of said one chain link and continuing to move at least one of said compressing members until said compressing members are separated a predetermined distance to shorten said one chain link while the temperature of said central portions thereof in cross section is substantially maximum, said predetermined distance being just sufficient to restore the pitch of said one chain link.

4,229,963

MACHINE FOR NONCUTTING METAL SHAPING

Evgeny A. Savinov, ulitsa Internatsionalnaya, 3, korpus 2, kv. 47, and Mikhail I. Baranaev, ulitsa Kombainovaya, 36, kv. 116, both of Ryazan, U.S.S.R.

Filed May 26, 1978, Ser. No. 909,992
Int. Cl.[3] B21J 9/18
U.S. Cl. 72—402 3 Claims



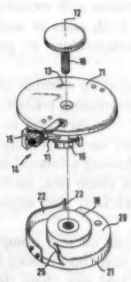
1. A forging machine comprising: a frame (14,16) having an opening longitudinal to the axis of said frame permitting a workpiece (L) to be moved, hammer means (2) equally spaced around the workpiece (L); main crankshaft means (7) for imparting reciprocation to said hammer means (2); a driving crankshaft means (13) of a crank gear mechanism (8) for transmitting rotary movement to said driving crankshaft means (7), wherein: the kinematic coupling of the main crankshaft means (7) with the driving crankshaft means (13), is accomplished by means of a lever (9) rigidly secured to the main crankshaft means (7) and pivotally connected to a connecting rod (10) of said crank gear mechanism (8).

4,229,964

APPARATUS FOR TREATING LEADS OF ELECTRICAL COMPONENTS

Thomas Weresch, Greschbachstr. 19, D-7500, Karlsruhe 41, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 18,917
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810654
Int. Cl.[3] B21J 9/18; B23P 23/00
U.S. Cl. 72—452 10 Claims



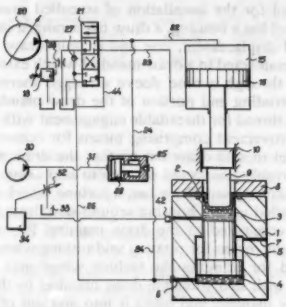
1. Apparatus for the preparation of leads of electrical components, such as transistors or the like, having a carrier plate rotatable about a fixed axis of rotation, at least one tool set arranged at the periphery of the carrier plate, said tool set including a stationary tool and a tool pivotable about a pivot axis that is parallel to the fixed axis of rotation, and a fixed cam disk, wherein the pivotable tool, during the rotation of the carrier plate, is controllable by an operating cam section of the fixed cam disk from an open position into a closed position and wherein the cam disk additionally has an opening cam section, the pivotable tool being controlled by means of the opening cam section from the closed position into the open position.

4,229,965

HYDRAULIC CIRCUIT OF A HYDROMECHANICAL DRAWING PRESS

Jindrich Spacek, Brno, and Jiri Kosek, Zdar, both of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie, Brno

Filed Mar. 31, 1978, Ser. No. 892,288
Claims priority, application Czechoslovakia, Apr. 5, 1977, 2256-77
Int. Cl.[3] B21J 9/18
U.S. Cl. 72—453.13 6 Claims



1. In the combination of a hydromechanical press for the drawing of a workpiece made of material in sheet form, the press having a body providing a fluid pressure chamber with a first space therein including a first cylinder, said first space receiving a first fluid which forms an external drawing die, the pressure chamber also having a second space therein including a second cylinder, said second space receiving a second fluid, a force transmitter separating the first and second spaces and having connected first and second pistons sealingly engaging and reciprocable in the said first and second cylinders, respectively, the press having a third, main working cylinder spaced from said body and having a working pressure side, a piston reciprocable in the main working cylinder and provided with a piston rod movable toward away from the first space in the body, a drawing punch mounted on the outer end of the piston rod for drawing a sheet workpiece in cooperation with the fluid in the first space in the body, and a source of fluid pressure selectively connectible with the pressure side of the main working cylinder to thrust the drawing punch toward the first space in the body and a sheet workpiece into said first space, whereby the improvement which comprises a conduit connecting the working pressure side of the main working cylinder to the second space in the fluid pressure chamber, and a first, controlled throttle valve interposed in said conduit.

4,229,966

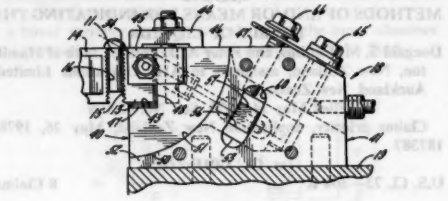
ADJUSTABLE HOLDER FOR THE STATIONARY DIE OF A THREAD ROLLING MACHINE

Warren M. Jackson, 5071 Crofton, Rockford, Ill. 61101

Filed Mar. 22, 1979, Ser. No. 22,927
Int. Cl.[3] B21H 3/06
U.S. Cl. 72—469 4 Claims

1. A holder for the stationary die of a thread rolling machine, said die including a thread forming face having upper and lower edges, said holder comprising a mounting block and an adjustable block suppoted on said mounting block, said die

being supported on said adjustable block, said mounting block being formed with a concavely arcuate seat having an axis coinciding with the upper edge of the thread forming face of said die, said adjustable block having a convexly curved surface concentric with said seat and disposed in engagement with said seat, means for securing said adjustable block to said



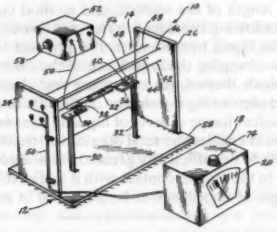
mounting block to hold said surface in engagement with said seat while permitting said surface to slide along said seat, and selectively adjustable means connected between said blocks and operable when adjusted to cause said surface to slide along said seat thereby to tilt the thread forming face of said die without changing the location of the upper edge of said thread forming face.

4,229,967

METHOD AND MEANS FOR TESTING THE FLAMMABILITY OF COMBUSTIBLE MATERIALS

Jerome J. Kneifel, and John C. Veburg, both of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed Dec. 26, 1978, Ser. No. 972,783
Int. Cl.[3] G01N *25/00*
U.S. Cl. 73—15 R **18 Claims**



1. A device for testing the flammability of a combustible material, comprising,

means for holding the material to be tested,

means for sensing ionization in the vicinity of the material to be tested, said means for sensing comprising a pair of spaced-apart polarized sensor elements,

means for supporting said sensor elements in spaced-apart relation to the material to be tested and at positions above and on opposite sides of said material whereby a flame supported by the combustion of said material will pass between said sensor elements,

circuit means to detect current flow in said means for sensing ionization, said circuit means being electrically connected to said sensing means, and

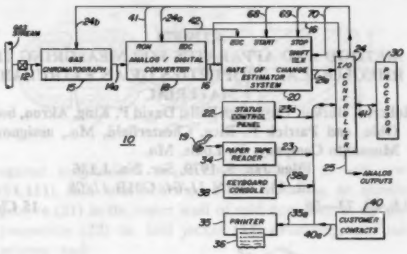
indicator means for indicating current flow detected by said circuit means, said indicator means being electrically connected to said circuit means.

4,229,968

GAS MEASUREMENT AND ANALYSIS SYSTEM

James F. Muldoon, Neptune, N.J., assignor to Electronic Associates, Inc., West Long Branch, N.J.

Filed Sep. 28, 1978, Ser. No. 946,784
Int. Cl.[3] G01N *31/08*
U.S. Cl. 73—23.1 **15 Claims**



1. A system for measuring and analyzing a gas mixture comprising

gas processing means for producing a time varying signal related to the constituents of the gas mixture,

means for sampling and converting to digital form said time varying signal thereby to provide a sampled data signal, and

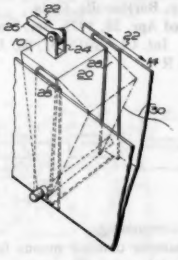
digital estimator means for providing a rate of change estimate signal with respect to time of said sampled data signal, said digital estimator means including (1) recursive digital feedback means coupled to an output of said digital estimator means for producing at least one past time value signal of the estimated rate of change signal and (2) feed forward means coupled to the sampling means for producing at least one other past time value signal of the sampled data signal, means for combining both past time value signals with the sampled data signal for producing a signal area defined for an interval and above the amplitude of one of said past time value signals thereby providing the estimated rate of change signal.

4,229,969

APPARATUS FOR MAKING WAVES IN A BODY OF LIQUID

William B. Hark, "The Paddocks" Frith La., Mill Hill, London, England (NW7 1PS)

Filed Mar. 12, 1979, Ser. No. 19,761
Int. Cl.[3] G01M *10/00*
U.S. Cl. 73—148 **5 Claims**



1. Apparatus for making waves in a body of liquid comprising a container for the liquid, including a longitudinal dimension and opposed inner surfaces spaced apart transversely, displacing means having an active face disposed substantially

transversely between said inner surfaces, said active face having opposed sides means for moving said displacing means longitudinally back and forth in said container between said opposed inner surfaces, so that said active face, in motion, creates a wave-pattern in the liquid, and further including flexible seal means between said sides and said opposed inner surfaces, to prevent liquid from flowing between said sides and said corresponding inner surfaces.

4,229,970

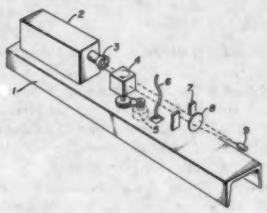
METHOD AND APPARATUS FOR MEASURING THE RHEOLOGICAL PROPERTIES OF AN EXTRUDABLE MATERIAL

Robert I. Barker, Cuyahoga Falls; David P. King, Akron, both of Ohio, and Patrick F. Rice, Chesterfield, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1979, Ser. No. 1,136

Int. Cl.³ G01N *11/04*; G01B *11/08*

U.S. Cl. 73—56 **15 Claims**



1. The method of measuring the rheological properties of an extrudable material comprising the steps of

(a) extruding a continuous strand of the material under controlled conditions of temperature and shear rate or shear stress,

(b) measuring the diameter of the strand periodically to provide a plurality of instantaneous diameter values,

(c) averaging the instantaneous diameter values over a finite number of such values to obtain an average diameter figure,

(d) measuring the frequency of those instantaneous values which depart from the average diameter figure by more than a given amount, and

(e) comparing the frequency thus obtained with a predetermined standard.

4,229,971

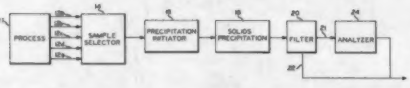
LIQUID SAMPLING SYSTEM

Otis E. Ririe, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 28, 1975, Ser. No. 572,043

Int. Cl.³ G01N *31/08*, *33/22*

U.S. Cl. 73—61 R **33 Claims**



1. Apparatus comprising:

at least one sample conduit means for providing a liquid sample material containing precipitatable material in solution;

means for initiating precipitation of said precipitatable material from said liquid sample material;

filter means for separating from the precipitated material at least a portion of the remaining liquid of said liquid sample material;

and liquid chromatographic analysis means for analyzing said portion of said remaining liquid material;

wherein said means for initiating precipitation comprises means for cooling said liquid sample material.

4,229,972

METHODS OF AND/OR MEANS FOR INDICATING THE LEVELS OF LIQUIDS

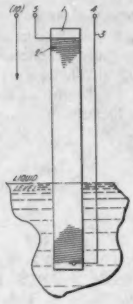
Dougald S. M. Phillips, and Peter A. J. Phillips, both of Hamilton, New Zealand, assignors to AHI Operations Limited, Auckland, New Zealand

Filed May 24, 1979, Ser. No. 42,106

Claims priority, application New Zealand, May 26, 1978, 187387

Int. Cl.³ G01F *23/24*

U.S. Cl. 73—304 R **8 Claims**



1. A method of indicating the level of an electrically conducting liquid milk in a vessel which contains a vertically disposed rod type resistor having adjacent lengths having an average cross sectional dimension between twenty and forty-five mm and a resistance of between three and thirty-two ohms per mm of length of the resistor, said method comprising the steps of (a) allowing the liquid to rise in the vessel in a manner such that the liquid interconnects the adjacent lengths of the resistor thus changing the impedance of the resistor appearing at the terminals thereof, (b) measuring that change of impedance and (c) converting the change of impedance into a display which indicates change of level of liquid in the vessel, whereby said dimension enables the total area of the resistor in contact with the milk to be sufficiently great to allow a good resistance connection to the milk in contact with it and enables extremely small changes of impedance to be measured in step (b).

4,229,973

DEVICE FOR BRAKING FLOAT MOTION IN FLOAT-TYPE LIQUID LEVEL GAUGE

Kunio Hara, Kawasaki, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Mar. 23, 1979, Ser. No. 23,068

Claims priority, application Japan, Mar. 29, 1978, 53/39297[U]

Int. Cl.³ G01F *23/10*

U.S. Cl. 73—317 **4 Claims**

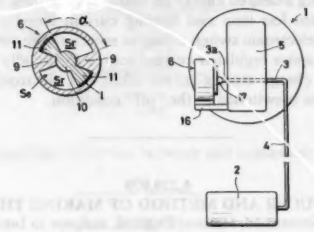
1. A device for braking the motion of a float in a float type liquid-level gauge used with a liquid container and adapted so that, by virture of the float kept on the liquid surface in the container by buoyant force and allowed to follow faithfully the vertical displacement of liquid level by the force of gravity acting thereon, the volume of the liquid in the container measured in terms of the height of the liquid level determinable by the position of the float relative to the container is indicated on the scale of the gauge, which device comprises:

a first member possessed of an inner chamber,

a second member accommodated within the inner chamber of the first member in such a manner as to produce a motion relative to the first member, the size of the second member being such that the inner chamber of the first member is large enough to accommodate the second member and also retain an extra space for permitting the motion of the second member relative to the first member.

a fluid placed to fill the extra space within the inner chamber of the first member,

a cover member serving to seal tightly the inner chamber containing therein the second member and the fluid,



a path for permitting the flow of the fluid within the tightly sealed inner chamber when there is produced a relative motion between the first and second members mentioned above,

means for fixing in position either one of the first and second members, and

means for connecting the other one of the first and second members with the part adapted to move in conjunction with the float,

said first member possesses a disc-like inner chamber and said second member being provided with vanes adapted to rotate around the axis thereof within the inner chamber, whereby the relative motion to be produced between the first and second members is a rotary motion.

4,229,974

PETROLEUM AND SYNTHETIC GREASE THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County; D. Colin Phillips, Monroeville, and Kenneth W. Grossett, Murrysville Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 27, 1978, Ser. No. 956,143

Int. Cl.³ G08B *21/00*; G01K *11/00, 13/00, 1/02*

U.S. Cl. 73—339 R **11 Claims**

1. A method of protecting electrical apparatus from damage due to overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected, comprising applying to said electrical apparatus at positions exposed to said gas stream a thermoparticulating grease selected from the group consisting of synthetic straight chain hydrocarbons, synthetic diesters, and mixtures thereof and detecting the particles in said gas stream formed from thermoparticulation of said grease.

4,229,975

THROWAWAY PLASTIC THERMOMETER STRUCTURE

Charles L. Rowe, 787 E. Illinois Rd., Lake Forest, Ill. 60045

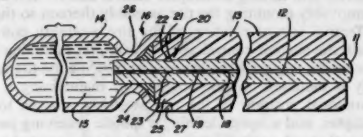
Filed May 21, 1979, Ser. No. 40,489

Int. Cl.³ G01K *5/08, 5/22*

U.S. Cl. 73—371 **11 Claims**

1. In a throwaway thermometer structure (**10,110**) having a thin wall tubular light-transmitting, gas impermeable core (**11,111**) defining a capillary bore (**12,112**) containing a column (**19,119**) of thermally expandable indicator liquid (**15,115**), an outer tubular light-transmitting jacket (**13,113**) formed of molded synthetic resin and provided with a temperature indicating scale (**17**), and a reservoir bulb (**14,114**) for the liquid at one end of the core, the improvement comprising:

cooperating interlock means on said core and jacket spaced from and adjacent said reservoir bulb defining a radially directed interlock (**20,120**) for locking said jacket (**13,113**)



against longitudinal displacement relative to said core (**11,111**), said interlock means (**20**) including an annular groove (**21**) in the outer wall of said core and an annular projection (**22**) on said jacket (**13**) extending into said groove; and

securing means for locking the reservoir bulb to the locked jacket.

4,229,976

CAPILLARY THERMOMETER CONTAINING VISIBLE SILICONE FLUID

James E. Jones, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1979, Ser. No. 71,452

Int. Cl.³ G01K *5/12*

U.S. Cl. 73—371 **6 Claims**

1. A thermometer comprising a transparent capillary tube portion which is closed at one end and which has a reservoir portion at the other end, said reservoir portion being in fluid communication with said transparent capillary portion, and an expanding fluid contained therein in sufficient amount to fill said reservoir portion and the provide a meniscus of said fluid in said transparent capillary tube portion at the intended temperature of use of said thermometer, said fluid consisting essentially of a silicone fluid having dissolved therein an amount of 1,4-bis(alkylamino)-9,10-anthraquinone sufficient to provide a color to said silicone fluid in said transparent capillary tube portion.

4,229,977

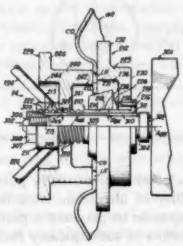
TIRE BALANCING MACHINE SYSTEM

Robert P. Newton, Tampa, Fla., assignor to Autodynamics, Inc., Tampa, Fla.

Division of Ser. No. 709,544, Jul. 28, 1976, Pat. No. 4,139,041. This application Jan. 11, 1979, Ser. No. 2,744

Int. Cl.³ G01M *1/06*

U.S. Cl. 73—487 **6 Claims**



1. A tire balancing machine for balancing a tire assembly

having an inflated pneumatic tire mounted on a vehicular wheel rim with an effective axis of rotation comprising:

a balancer drive spindle rotatable about a balancer spindle axis;

balancer drive key means fixedly mounted on and rotatable with said balancer drive spindle;

a tire assembly mounting adapter removably mounting the tire assembly thereon independently of said balancer drive spindle and having an adapter central axis for fixedly yet removably mounting the tire assembly thereon so that the effective axis of rotation of the tire assembly coincides with the adapter central axis, said adapter including drive means for engaging the tire assembly while the tire assembly is mounted on said adapter for maintaining a fixed rotational position of the tire assembly relative to said adapter, said adapter defining a spindle receiving passage therethrough concentric about said adapter central axis so that said balancer drive spindle is slidably receivable therethrough to removably mount said adapter with the tire assembly thereon on said balancing machine with the adapter central axis coinciding with said balancer spindle axis, and said adapter including key engaging means for engaging said balancer drive key means when said adapter is mounted on said balancer drive spindle; and

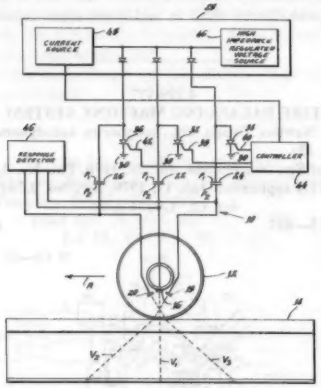
adapter locking means for selectively engaging said balancer drive spindle and said tire mounting adapter to force said key engaging means on said tire mounting adapter into engagement with said balancer drive key means, said balancer drive key means and said key engaging means constructed and arranged so that engagement between said balancer drive key means and said key engaging means maintains said tire mounting adapter fixed axially along the length of said balancer drive spindle and fixed rotationally with respect to said balancer drive spindle.

4,229,978

SYSTEM FOR SELECTABLY PULSING ULTRASONIC TRANSDUCERS IN A TEST APPARATUS

Howard A. Sholl, Storrs, and John T. Marshall, Willimantic, both of Conn., assignors to Dapco Industries, Inc., Ridgefield, Conn.

Filed Oct. 2, 1978, Ser. No. 947,482
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—626 **7 Claims**



1. A system for selectably electrically pulsing subsets of at least one of a plurality of ultrasonic transducers in a testing aparatus in rapid sequence to produce a pattern of ultrasonic energy transmitted into and subsequently received from a test piece, said system comprising:

a plurality of transducer pulsing circuits, each connected to a different associated one of said transducers and including charge storing means dischargeable to electrically pulse said associated transducer and electronic switch means connected between said charge storing means and ground, said electronic switch means being switchable to an "on" condition to rapidly discharge said charge storing means, said electronic switch means further maintaining said "on" condition until current conducted thereby drops below a characteristic holding current and thereafter switching to an "off" condition; and

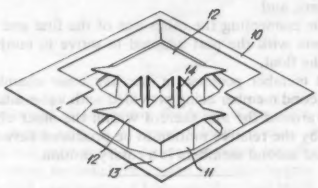
switched regulator means connected to each of said pulsing circuits for recharging said charge storing means therein, including a high impedance source of voltage for maintaining a desired charge on said charge storing means at a current less than said holding current thereby allowing said electronic switch means to switch to the "off" condition and a regulated current source for rapidly charging said charge storing means after said electronic switch means is switched to the "off" condition.

4,229,979

TRANSDUCER AND METHOD OF MAKING THE SAME

John C. Greenwood, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 29, 1979, Ser. No. 43,446
Claims priority, application United Kingdom, May 30, 1978, 24186/78
Int. Cl.[3] G01L *11/00*
U.S. Cl. 73—704 **2 Claims**



1. A pressure transducer comprising: a flexible diaphragm supported in a frame of the same material as the diaphragm; first and second lands extending from one surface of said diaphragm; a plurality of filaments stretched and fixed between said lands; and means to vibrate said filaments at their respective resonant frequencies as determined by the configuration of said diaphragm, movement of said diaphragm producing movements of said lands toward and away from each other, said movements respectively causing stresses, strains and therefore lengthwise contractions and elongations of said filaments and thereby respective lowering and raising of the tensions in and the resonant frequencies of said filaments.

4,229,980

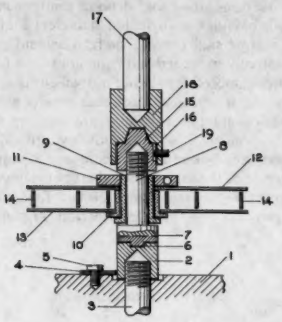
POWER TAKE-OFF

William Kingston, 47 Mespil Rd., Dublin 4, Ireland

Division of Ser. No. 796,518, May 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 659,229, Feb. 19, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,475
Int. Cl.[3] F16H *37/00*; F02N *1/00, 7/00*
U.S. Cl. 74—15.63 **4 Claims**

1. A power take-off for a motor, comprising, in combination, an extension to an unmodified motor crankshaft, said extension arranged to penetrate a recoil starter mounted axially in relation to said flywheel, a spindle carrying the sheave of said starter, arranged to permit the passage of said extension there-

through, and locking means for preventing torque from separating said extension from said crankshaft, said locking means



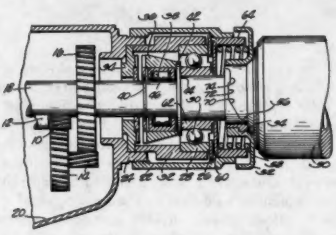
being independent of friction between said crankshaft and said extension.

4,229,981

REVERSIBLE HAMMER DRILL

Barry L. Macky, Grafton, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Sep. 18, 1978, Ser. No. 943,577
Int. Cl.³ B23B *45/16*; F16H *37/16, 25/12, 25/14*
U.S. Cl. 74—56 **4 Claims**



1. A rotary hammer drill of the type having a drive spindle mounted in the housing for limited axial movement, a first ratchet member mounted on the spindle for axial movement with the spindle, a second ratchet member fixed in the housing, said ratchet members having confronting faces having complimentary ratchet faces which cam the first member from the second member when the spindle is rotated in the forward direction, characterized in that the spindle is driven by a reversible motor and a one way clutch is operatively connected between the spindle and said first ratchet member to drive the first ratchet member in the forward direction only.

4,229,982

CAM DRIVE SYSTEM HAVING PARALLEL INPUT AND OUTPUT SHAFTS

Joseph F. Cattorini, Palm Bay, and Subhash R. Dandage, Rockledge, both of Fla., assignors to Documation Incorporated, Melbourne, Fla.

Filed Nov. 13, 1978, Ser. No. 959,748
Int. Cl.³ F16H *21/12, 21/48*
U.S. Cl. 74—63 **18 Claims**

1. A cam drive system having parallel input and output shafts and means for rotating said input shaft, said system comprising:

a. a plurality of geometrically identical cams coupled along the length of said input shaft at equal angular intervals, each said cam having a camming surface occupying an arc of less than one hundred eighty degrees and including
   i. a radially outwardly sweeping step section;
   ii. a constant radius dwell section adjacent said step section;

b. a plurality of geometrically identical cam followers coupled in diametrically opposed pairs at equal angular intervals along the length of said output shaft, each pair of said

followers being aligned to engage the entire camming surface of a single one of said cams; and

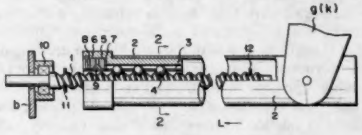
c. biasing means coupled to said output shaft for continuously biasing said cam followers against the camming surfaces of said cams, whereby the continuous rotation of said input shaft is converted into stepped angular displacements of said output shaft, each stepped displacement of said output shaft being followed by a dwell interval of a predetermined duration.

4,229,983

BALL-AND-SCREW POWER TRANSMISSION DEVICE

Masayasu Morita, Fuchu, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,287
Int. Cl.² F16H *27/02, 29/02, 29/20*
U.S. Cl. 74—89.14 **2 Claims**



1. A ball-and-screw power transmission device operable in non-counter and counter directions, comprising:

elongated screw means provided with at least one thread;

at least one spherical member disposed in between the adjacent turns of said thread;

a sleeve in which said at least one spherical member is supported;

an outer cylindrical member surrounding said sleeve and having an inner wall surface with which said at least one spherical member is in contact; and

friction means disposed to be in contact with said sleeve upon axial displacement of said sleeve to frictionally restrain rotation of said sleeve relative to said outer cylindrical member when said sleeve is axially displaced, said friction means including a pair of friction rings disposed in said outer cylindrical member and being non-rotatable

relative to said outer cylindrical member, said friction rings being biased toward each other and being movable in the axial direction of said outer cylindrical member;

said sleeve having an integrally formed flange positioned between said friction rings of said friction means;

said at least one spherical member revolving while rotating around said screw means jointly with said sleeve during non-counter-direction operation of said transmission device, and said at least one member and said sleeve abutting to be fixed relative to said outer cylindrical member by means of said friction means when said sleeve is axially displaced during counter-direction operation of said transmission device.

4,229,984

STEP BY STEP MOTOR AND/OR BRAKE DEVICE

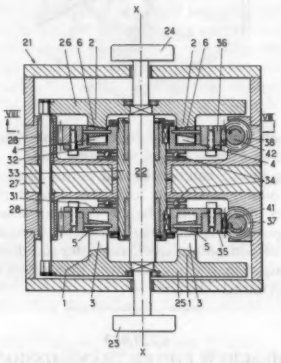
Jean-Pierre Pegourie, Montpellier, France, assignor to Agence Nationale de Valorisation de la Recherche-Anvar, France

Filed Jul. 28, 1978, Ser. No. 929,014

Claims priority, application France, Aug. 2, 1977, 77 23702

Int. Cl.[2] F16D *27/10*

U.S. Cl. 74—125.5 **28 Claims**



1. A step by step motor and/or brake device by controlled translation, characterized in that it comprises, in a casing having a shape generally cylindrical about an axis XX, a sliding assembly, comprising a shaft carrying two pistons for the pneumatic control of its reciprocal sliding, with means for guiding this sliding, and carrying two symmetrical annular rings, provided with identical and consecutive cavities whose periphery is in the shape of an asymmetrical V with one leg parallel to said axis and with the other leg comprising an external part forming with said axis an angle less than about 60°, and preferably equal to about 30°, and an internal part parallel to said axis, said cavities of one annular ring being staggered angularly in relation to the other annular ring, by half of the width of a cavity, and a rotating assembly, comprising a sleeve rotating in said casing and carrying an irreversible gear wheel meshing with an output pinion, and on said sleeve two discs, each disc being mounted on said sleeve with an angular clearance at least equal to half of the width of said cavities and with a spring taking up this angular clearance, each disc comprising several, particularly three, cylindrical rollers.

4,229,985

CONTINUOUS VARIABLE SPEED TRANSMISSION

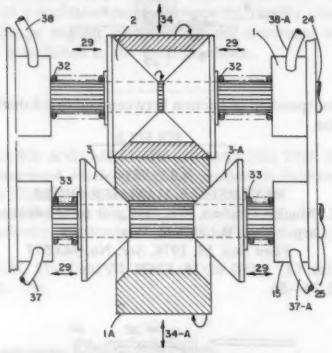
Domenic Borello, 142 Nyac Ave., Pelham, N.Y. 10803

Filed Dec. 22, 1977, Ser. No. 863,393

Int. Cl.[3] F16H *15/16, 15/42*

U.S. Cl. 74—192 **2 Claims**

2. A variable speed transmission comprising a driving shaft and a driven shaft journalled for rotation in spaces apart parallel relation and disposed in a common plane, a first pair of driving cones operatively arranged with the apexes thereof in facing relation to each other disposed for sliding movement in opposite directions along said driving shaft, each said cone of said first pair having sides oriented at a select acute angle to the rotational axis of said driving shaft, a second pair of driven cones operatively arranged with the apexes in facing relation to each other disposed for sliding movement in opposite directions along said driven shaft, each said cone of said second pair having sides oriented at a select acute angle to the rotational axis of said driven shaft, a first hollow cylindrical sleeve member having edges bounding opposite end openings into the hollow interior of the said sleeve, thereof oriented at the same angle as said sides of said cones of said first pair having an operative position in supported relation suspended between



said first pair of cones, a second hollow cylindrical sleeve member having edges bounding opposite end openings into the hollow interior of the said sleeve, thereof oriented at the same angle as said sides of said cones of said second pair having an operative position in supported relation suspended between said second pair of cones, and means for varying the speed ratio between said driving shaft and said driven shaft by the sliding movement of said first and second pairs of cones into operative positions on said driving and driven shafts to produce frictional driving contact at the interface of the external surfaces of said first and second cylindrical sleeve members and frictional driving contact whereby said first pair of cones are not required to be in alignment or to remain in alignment with said second pair of cones in order for the apparatus to be in frictional engagement.

4,229,986

AXIAL LOADING DEVICE

Raymond Sharpe, Mirfield, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 824,151, Aug. 12, 1977, abandoned. This application Sep. 7, 1979, Ser. No. 73,231

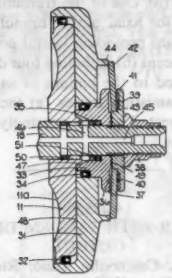
Claims priority, application United Kingdom, Aug. 14, 1976, 33907/76

Int. Cl.[3] F16H *15/38*

U.S. Cl. 74—200 **4 Claims**

1. An axial loading device for applying an axial load to an axially movable member including spring means acting between an abutment and the member, said member being axially movable relatively to said abutment, the spring means acting on one part of said member in a first axial position of said member and acting on a further part of said member when it is in a further axial position, the said one part of the member being spaced from the said further part of said member, such that different axial loading is applied to said member by said spring means when the member occupies said first and said further axial positions respectively wherein said axially movable member includes inner and outer coaxial elements, one of

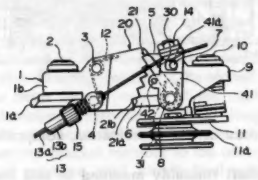
said elements including said one part upon which said spring means acts when said member is in a first axial position, the other of said elements including said further part of said member upon which said spring means acts when said member is in a further axial condition, said two coaxial elements being relatively axially movable with respect to each other.



4,229,987
BICYCLE DERAILLEUR HAVING POSITIVE SPEED POSITION RETENTION

Hideaki Fujimoto, Toyonaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Feb. 15, 1979, Ser. No. 12,607
Claims priority, application Japan, Feb. 28, 1978, 53-23909
Int. Cl.[2] F16H 7/22, 7/00
U.S. Cl. 474—82 17 Claims



1. In a bicycle derailleur comprising four members, a fixing member, two linkage members and a movable member mounting a chain guide, two members of said four members carrying a return spring between them so that the cooperative operation of a control cable comprising an inner wire and an outer sheath and the action of said return spring enables said movable member to reciprocate with respect to said fixing member for changing the bicycle speed, the improvement comprising:

a control element for setting said movable member in a proper position corresponding to a desired speed change stage, said control element being supported to one of said four members and having a plurality of engageable portions corresponding to the number of speed change stages said movable member reciprocates among for changing the bicycle speed, said engageable portions having engaging faces for each speed change stage and connecting faces for interconnecting said engaging faces;

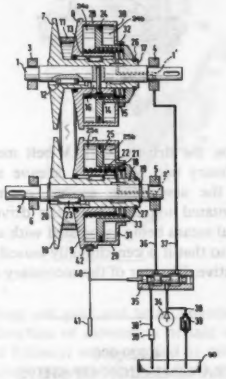
a retainer engageable with a said engaging face at each of said engageable portions of said control element for retaining said movable member in a proper position corresponding to a desired speed change stage, said retainer being supported swingably to another member of said four members, said another member being relatively movable with respect to said one member carrying said control element;

a spring urging said retainer in a first direction where said retainer engages with said engageable portions of said control element; and spring means for moving said retainer in a second direction where said retainer disengages from said engageable portions of said control element, said spring means for moving being provided adjacent said retainer and operable such that when said control wire is operated to allow said return spring to act to return said movable member said means for moving causes said retainer to be disengaged from said engageable portions.

4,229,988
CONTINUOUSLY VARIABLE CONE PULLEY BELT-DRIVE GEARING

Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Reimers Kommanditgesellschaft, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,472
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744947
Int. Cl.[2] F16H 55/52
U.S. Cl. 474—28 5 Claims



1. An infinitely variable cone pulley belt-drive transmission arrangement with a tractive means arranged to revolve around first and second pairs of cone discs having a symmetric pulley wedge, wherein each disc pair has a common shaft and comprises a first cone disc with an extended hub and a second cone disc carried on the extended hub, and wherein on one side of the tractive means there is a pressure means for each disc pair, each pressure means comprising a cylinder and a piston, the cylinder being secured to the respective second cone disc and radially supported on the respective shaft by way of cover means provided on the cylinder and the piston being secured to the hub of the respective first disc, the fist disc of one disc pair being axially slidable on its shaft and the second disc of the said one disc pair being axially fixed to the shaft by its associated cylinder and the first disc of the other disc pair being axially fixed by its hub to its shaft and the second disc of the other disc pair being carried on the shaft in an axially slidable manner by way of its associated cylinder cover means.

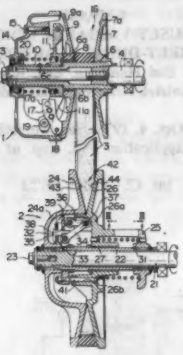
4,229,989
V-BELT TYPE AUTOMATICALLY VARIABLE TRANSMISSION

Jyoji Tamura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 28, 1978, Ser. No. 964,253
Claims priority, application Japan, Nov. 29, 1977, 52-143101
Int. Cl.[3] F16H 55/52
U.S. Cl. 474—12 7 Claims

1. V-belt type automatically variable transmission comprising a primary sheave assembly having an effective diameter and mounted on a drive shaft adapted to be driven by a prime-

mover, centrifugal means associated with the primary sheave assembly for biasing it so that the effective diameter is increased in accordance with an increase in rotating speed of the drive shaft, a secondary sheave assembly having an effective diameter and provided on a driven shaft, cam means associated with said secondary sheave assembly for biasing it so that the effective diameter is increased in accordance with an increase



in torque load on the driven shaft, V-belt means stretched between the primary and secondary sheave assemblies for interconnecting the assemblies, second centrifugal means adapted to be rotated together with the driven shaft, said second centrifugal means being associated with said secondary sheave assembly so that it is centrifugally biased in a direction wherein the effective diameter of the secondary sheave assembly is increased.

4,229,990

TRANSMISSION OF SHIPS

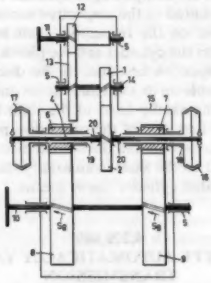
Hans Steinberg, Witten, and Wolfgang Sudhoff, Dortmund, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,006

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724783

Int. Cl.³ F16H *3/14*

U.S. Cl. 74—377 **13 Claims**



1. A transmission for a ship's drive system having a first, engine-driven shaft as input of the transmission and a second shaft as output thereof, comprising:

a pair of relatively large diameter spur gears, drivingly connected to the second shaft for driving the second shaft; first and second pairs of pinions, the pinions of each pair being coaxially arranged and respectively meshing the spur gears of the pair so that each spur gear meshes with two of the pinions;

first gear means connected to be driven by the first shaft; and

second gear means which includes cascaded transmission means (a) and (b), one of the transmission means (a) and (b) providing for axial power branching, the other one being gear means providing lateral power branching, the transmission means (b) including four driven shafts respectively connected to the pinions of said first and second pairs, the transmission means (a) including gear means drivingly connected to and gearingly meshing with the first gear means.

4,229,991

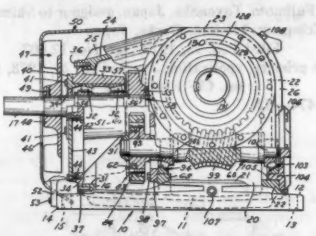
GEAR REDUCER WITH TANDEM DRIVES TO THE OUTPUT

Walter H. Douglas, Centerville, Ohio; Richard F. Peterson, Traverse City, Mich.; Willard J. Nielsen, Traverse City, Mich.; Charles D. Treat, Traverse City, Mich.; Jerry B. Hagaman, Traverse City, Mich.; Wendell G. Loveless, Traverse City, Mich., and William R. Scott, Rapid City, Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 27, 1978, Ser. No. 890,355

Int. Cl.² F16H *55/18, 57/00, 37/06*

U.S. Cl. 74—409 **6 Claims**



1. In a speed reducer, the combination, comprising:

(a) a housing;

(b) an input shaft rotatably mounted in said housing in a horizontal plane;

(c) an idler drive pinion operatively mounted on said input shaft;

(d) a pair of laterally spaced apart worm shafts rotatably mounted in said housing in positions parallel to each other and parallel to said input shaft;

(e) an idler driven pinion operatively mounted on each of said worm shafts and meshed with and driven by said idler drive pinion;

(f) an output shaft rotatably mounted in said housing in said horizontal plane;

(g) a pair of worm gear sets including a pair of worm gears operatively mounted on said output shaft, and a worm on each of said worm shafts; and

(h) load sharing means for obtaining equal load distribution between the idler pinion and driven pinions and the worms and worm gears of said pair of worm gear sets, said load sharing means comprising:

(1) means for adjustably mounting one of said idler driven pinions on one of said worm shafts;

(2) each tooth on said idler drive pinion having a drive face and a non-driving face;

(3) each tooth on each of said idler driven pinions having a drive face and a non-driving face;

whereby said driving face of said teeth of the idler driving pinion are in simultaneous contact with the driving face of said teeth of both idler driven pinions.

4,229,992

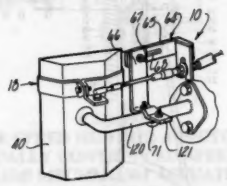
MIRROR ACTUATOR

Clyde M. McKee, 22175 Bernard, Taylor, Mich. 48180, and Ward Scott, 429 Rochdale Dr., Rochester, Mich. 48063

Continuation-in-part of Ser. No. 706,448, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 526,794, Nov. 25, 1974, Pat. No. 3,969,982. This application Jun. 28, 1978, Ser. No. 920,113

Int. Cl.[2] F16C 1/10

U.S. Cl. 74—501 M 3 Claims



1. A mirror actuator assembly adapted for use in conjunction with an exteriorly mounted conventional right hand mirror already mounted on a vehicle by at least one strut, said mirror being pivotally mounted around a generally vertical axis of rotation, said assembly comprising:

a cable assembly having an outer sleeve portion and an inner wire member;

one end of said inner wire member extending into said vehicle and including means attached thereto for selectively moving said inner wire member axially within said outer member;

means removably attaching the opposite end of said inner wire member to said mirror to produce rotation of said mirror around said vertical axis upon axial movement of said inner wire member along an axis of movement; and

a bracket assembly having a first elongated bracket member and a second elongated bracket member, means for securing one end of said first bracket member to the strut, means for securing one end of the second bracket member to the outer sleeve portion of the cable assembly at a predetermined longitudinal position along the outer sleeve portion and means for longitudinally adjustably securing said second bracket member to the other end of said first bracket member, said longitudinal adjustable securing means further comprising an elongated slot formed through said second bracket member, an aperture formed through said other end of the first bracket member and fastener means which extends through said slot and said aperture for locking said bracket members together at an adjusted position, whereby with the inner wire member stationary with respect to the outer sleeve portion the angular position of the mirror can be varied by adjusting the longitudinal position of the second bracket member and wherein said longitudinal adjustable securing means further includes means for securing said bracket members together in a selected pivotal position with respect to each other whereby said one end of the first bracket member can be selectively secured to either a vertical or horizontal strut and wherein said elongated slot in said second bracket member extends substantially parallel to said axis of movement when said first bracket member is connected to either a vertical or a horizontal strut.

4,229,993

ACTUATING DEVICE

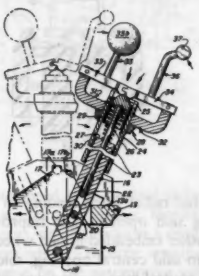
Herman J. Andresen, 1330 Woodlawn Ave., Glenview, Ill. 60025

Filed Apr. 7, 1978, Ser. No. 894,338

Int. Cl.[3] G05G 5/06

U.S. Cl. 74—538 10 Claims

1. An actuating device for use in simultaneously converting predetermined input forces into stored energy within the device and into an output force sufficient to overcome a resilient first external resistance of known magnitude and, upon release of the input forces, utilizing the stored energy within the device in combination with the resiliency of the first external resistance to overcome a second external resistance whereby neither the force of the resiliency of the first external resistance nor the force of the stored energy of the device when acting alone is sufficient to overcome same, said device comprising an adjustably mounted shaft means normally positioned at a given rest position and selectively movable therefrom along a predetermined path; first means retaining said shaft means at said given rest position; handle means mounted on and movable as a unit with said shaft means, said handle means being responsive to at least a predetermined squeeze input force and moving said shaft means away from said first means and effecting a single controlled output force overcoming the resilient first external resistance; fixedly mounted cam surface means adjacent said shaft means and disposed along said predetermined path, said cam surface means having segments thereof in proximity to said first means and extending substantial distances



therefrom along said path and being angularly disposed relative to the direction of movement of said shaft means along said path; and follower means carried by said shaft means and being selectively movable independently thereof a limited amount, said follower means being operatively connected to said handle means and biased to normally engage said cam surface means, said follower means being disengageable from said cam surface means and said first means upon the application of said predetermined squeeze input force to said handle means and said shaft means being movable from the rest position in response to an additional application to said handle means of an input force of predetermined magnitude; upon release of the input forces on said handle means when the shaft means is within the path and offset from said rest position, said biased follower means coacting with said segments of said cam surface means and producing a vector force combining with the resiliency of the first external resistance to overcome the second external resistance and return said shaft means to said rest position.

4,229,994

STEERING WHEEL MOUNTING

Gunter Plamper, Brunswick, Ohio, assignor to MTD Products Inc, Cleveland, Ohio

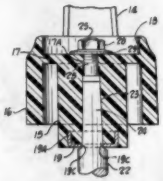
Filed Aug. 21, 1978, Ser. No. 926,408

Int. Cl.[2] G05G 1/12

U.S. Cl. 74—552 3 Claims

1. In a vehicle having a rigid metal steering shaft, the shaft having an upper end portion, a steering wheel mounting structure for the mounting of a steering wheel to the said upper end portion of the said rigid metal steering shaft, the steering wheel being molded of plastic resin, said upper end portion of the shaft having opposed flat sides inclined inwardly toward each other progressively toward the upper end of the shaft, said upper end portion being threaded adjacent the upper end of the shaft for threaded interengagement with a nut, said steering

wheel having a hub portion, the said hub portion having an upper side and lower side and having a central opening extending axially therethrough for receiving said upper end portion of the shaft upon insertion of the upper end portion of the shaft upwardly into the entrance of the opening at the lower side of the hub portion, the said opening having opposed flat walls inclined inwardly toward each other progressively toward the upper side of the hub complementing the said flat sides of said shaft end portion to engage the same closely, said flat sides of the shaft upper end portion interengaging with the flat walls of the hub for providing rotation of the shaft upon turning of the wheel, the interengagement of the opposed inclined flat sides of the shaft upper end portion with the opposed inclined flat walls of the central opening in the hub being such that, upon the drawing down of a nut threadably engaged with the threaded end portion of the shaft to impart a downwardly axially directed force on the hub toward the shaft, the said inclined flat walls of the said shaft end portion by a wedging action against the inclined flat walls of said recess exert an



outwardly directed radial force tending to expand the wheel hub surrounding said opening, the improvement of a cup-shaped metal washer embedded in said wheel hub adjacent the said entrance into said central opening, said washer having a substantially flat central base portion and side walls extending upwardly from the periphery of said base portion, said washer having a bore complementing the cross-sectional shape of said end portion of the shaft in a plane transverse of said end portion of the shaft at said entrance of the opening, the base portion of the washer being disposed in the said hub portion at the lower side thereof in position to engage said upper end portion of the shaft, the side walls of the cup-shaped washer extending into the wheel hub outwardly of the said opening, the said washer embedded in the wheel hub resisting the said wedging action tending to expand the wheel hub, the said bore in said washer having oppositely disposed flat edge portions for interengaging with the opposed flat sides of the shaft end portion to interlock therewith against rotational movement of the washer relative to the shaft.

4,229,995

LOCKING MECHANISM FOR AN ADJUSTABLE SPINDLE DRIVE

Felix R. Bernasconi, Zollikerberg, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 15, 1979, Ser. No. 20,745

Claims priority, application Switzerland, Mar. 16, 1978, 2859/78

Int. Cl.³ F16D 7/00

U.S. Cl. 74—625 **14 Claims**

9. A spindle drive comprising:

a housing;

a spindle rotatable within said housing;

a gear drive for rotating said spindle and axially movable relative to the spindle;

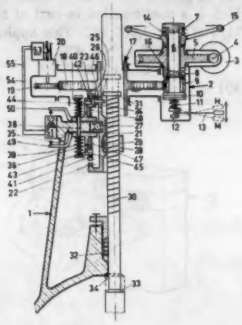
said gear drive including locking elements which limit rotation of said spindle;

locking elements for engaging said locking elements on said gear drive;

said locking elements being resiliently mounted on said housing and operatively engaged by the gear drive;

switches for actuating the gear drive, said switches being controlled by deflection of said resiliently mounted locking elements when engaged by the gear drive; and

a shiftable cam carried by said gear drive for selectively maintaining said resiliently mounted locking elements out



of engagement with said locking elements on the gear drive;

wherein said locking elements on said gear drive engage said resiliently mounted locking elements during a selected period of spindle travel to prevent continued rotation of the spindle.

4,229,996

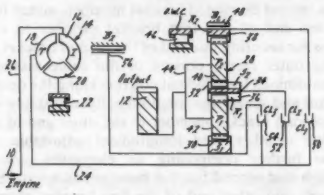
COMPACT FOUR SPEED AUTOMATIC TRANSMISSION

Daniel H. Hildebrand, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1978, Ser. No. 966,979

Int. Cl.² F16H 47/08, 57/10

U.S. Cl. 74—688 **3 Claims**



1. A planetary, multiple-ratio power transmission mechanism having compound gearing and a hydrokinetic unit, the hydrokinetic unit having an impeller and a turbine arranged in a toroidal fluid flow circuit; said planetary gearing comprising two sun gears, two ring gears, two sets of planet pinions and a carrier that is common to each set of planet pinions, a driven member connected to said carrier, a driving member connected to said impeller; a first of said sun gears, a first of said ring gears, a second of said sun gears and a second of said ring gears being arranged in radial disposition one with respect to the other; said first ring gear and said second sun gear being common and formed on a ring, the external teeth of said second sun gear being formed on the periphery of said ring and the internal teeth of said first ring gear being formed on the internal periphery of said ring, a first of said sets of planet pinions engaging drivably the first sun gear and said first ring gear, a second of said sets of planet pinions engaging drivably said second sun gear and said second ring gear, said planet pinions being rotatably supported by said common carrier; first selectively engageable clutch means for distributing driving torque to said second ring gear, second selectively engageable clutch means for delivering driving torque from said turbine to said ring, third selectively engageable clutch means for distributing driving torque from said turbine to said first sun gear, and brake means selectively engageable for anchoring said first sun

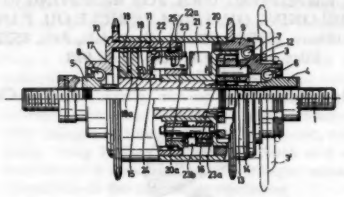
gear during operation in the first and fourth speed ratios, said first and second clutches being engaged during third speed ratio operation and said first clutch means being engaged during overdrive operation, said third clutch means being engaged during reverse drive operation as said second ring gear acts as a reaction point during reverse drive.

4,229,997

MULTIPLE SPEED HUB FOR A BICYCLE WITH CENTRIFUGALLY CONTROLLED SPEED CHANGE AND OVERRIDE MECHANISM ACTUATED BY BACK PEDALING

Hans-Joachim Schwerdhöfer, Schweinfurt am Main, Fed. Rep. of Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,782
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635442
Int. Cl.[3] F16H *3/74, 5/52*
U.S. Cl. 74—752 E 18 Claims



1. A two-speed gear hub for bicycles and the like comprising:

(a) a hub axle;

(b) a hub sleeve rotatably mounted on said hub axle;

(c) a planetary gear transmission in said hub sleeve including first and second transmission members operatively connected for simultaneous rotation about said axle at different speeds;

(d) drive means for rotating said members in a forward direction and in a backward direction;

(e) an overrunning clutch operatively interposed between said first transmission member and said hub sleeve for transmitting torque from said first member to said hub sleeve when said first member is rotated in said forward direction;

(f) a pawl-and-ratchet clutch operatively interposed between said second transmission member and said hub sleeve and operable for transmitting torque from said second member to said hub sleeve when said second member is rotated in said forward direction;

(g) a flyweight switch responsive to the rotary speed of one of said first and second transmission members for operating said pawl-and-ratchet clutch; and

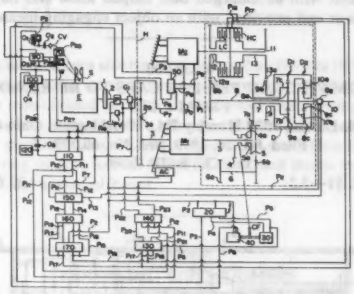
(h) control means responsive to backward rotation of said drive means and operating to be alternatingly switched between two operating positions for overriding said flyweight switch and for permitting engagement of said pawl-and-ratchet clutch in one of said operative positions and for preventing said engagement when in the other of said operative positions.

4,229,998

AUTOMATIC SPEED RATIO CONTROL SYSTEM FOR STEPLESS TRANSMISSION OF AUTOMOTIVE VEHICLES

Kiyofumi Mizuno, Nagoya; Hiroaki Maeda, Toyota; Shigeo Takahashi, Kariya; Masanori Sato, and Satomi Suzuki, both of Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 19, 1978, Ser. No. 917,034
Claims priority, application Japan, Jun. 22, 1977, 52-74137
Int. Cl.[2] B60K *41/12, 41/16*
U.S. Cl. 74—865 3 Claims



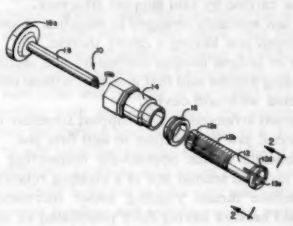
1. In an automatic speed ratio control system for a stepless transmission of an automotive vehicle, having a desired value signal generator means which produces a desired engine speed signal which corresponds to a throttle opening for controlling operation of an engine on the automotive vehicle, a detector means for producing a signal indicative of operation of the engine, a control signal generator means for comparing the signal from the detector means against the desired value signal from the desired value signal generator means to generate a deviation signal in accordance with a deviation therebetween and a controller means responsive to the deviation signal from the control signal generator means to change a speed ratio of the stepless transmission, said means comprising an integration servo control system further including means for producing a differential signal indicative of a differential or pseudo-differential of a throttle opening during the time the throttle opening increases, the differential signal being added in opposing relationship with the desired value signal from the desired value signal generator means or the deviation signal from the control signal generator means.

4,229,999

VALVE ADJUSTMENT TOOL

Joseph G. Rottigni, 3659 Greenwood Ter., Chalfont, Pa. 18914

Filed Jun. 11, 1979, Ser. No. 47,311
Int. Cl.[3] B25F *1/00*
U.S. Cl. 81—3 F 4 Claims



1. A tool comprising:

a barrel having a bore therethrough and provided with a collet portion at its lower end and external threads intermediate the ends of the barrel;

a collar overlaying and surrounding said collet portion and movable between a first position wherein said collet portion is compressed and a second position wherein said collet portion is uncompressed;

an internally threaded sleeve threadably engaging said barrel, the lower end of said sleeve confronting the upper end of the collar; and

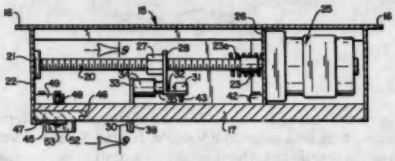
a rotatable and axially adjustable driver reposing within the bore of the barrel, said driver having an upper end provided with an enlarged disc shaped knob and having a lower end provided with an object engaging means.

4,230,000

AUTOMATIC GRIPPER FOR CAPS TO BE REMOVED FROM JARS

Edgar S. Downs, 6530 Huntley Rd., Worthington, Ohio 43085

Filed Jul. 26, 1979, Ser. No. 60,779
Int. Cl.³ B67B *7/08*
U.S. Cl. 81—3.2 **20 Claims**



1. A device for gripping the cap of a capped jar to facilitate turning of the jar relative to the cap, comprising a cap-contacting surface for engaging the outer surface of the cap, jaws at said surface and relatively movable towards and away from each other to clamp and release the cap, means for producing the relative movement comprising a screw operatively connected to the jaws and means for driving the screw, and trigger mechanism engaged by the cap as it is positioned in engagement with said surface and at least one of the jaws to actuate said driving means.

4,230,001

TATOOING PINCERS FOR MARKING EARS OF ANIMALS

Erwin Noll, Klein-Weinbach 1, and Karlheinz Knoerr, Fichtenhof, both of 6294 Weinbach 4, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 42,882
Int. Cl.³ B43K *5/00*
U.S. Cl. 81—9.22 **10 Claims**

1. Tatooing pincers for marking ears of animals by injection of a tatooing liquid, said pincers comprising:

a portable support structure,

a first jaw carried by said support structure,

a second jaw movably arranged in direction to said first jaw, said second jaw having a cavity therein,

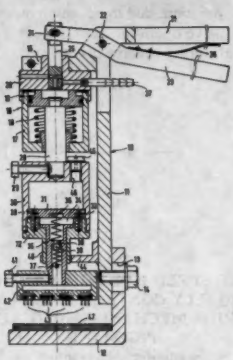
a number of hollow needles carried by said second jaw and protruding against said first jaw, said hollow needles being connected with said cavity,

a drive means arranged on said support structure for moving said second jaw in direction to said first jaw,

an intermediate means operatively connecting said drive means and said second jaw in a yielding relationship, said intermediate means yielding under increased pressure after said needles having fully penetrated an animal's ear located between said first and second jaws,

a storage chamber for tatooing liquid and

a pump chamber comprised by said intermediate means and connected to said storage chamber and said cavity by check valves,



the volume of the pump chamber being reduced when said intermediate means yields thereby pressing tatooing liquid out of said pump chamber through said cavity and said hollow needles into animal's ear.

4,230,002

FUNNEL EMPLOYING TOOL FOR REMOVING PLUG AND DRAINING OIL FROM VEHICLE OIL PAN

Paul E. Skidmore, 2535 N. 68th St., Scottsdale, Ariz. 85257

Filed Aug. 2, 1979, Ser. No. 62,970
Int. Cl.³ B25B *13/06*
U.S. Cl. 81—121 R **9 Claims**

1. A dual purpose tool for removing drain plugs of vehicle oil pans and substantially simultaneously receiving the oil draining therefrom comprising:

a funnel shaped member,

said member having an open flared end for receiving the oil draining from the drain port of the vehicle oil pan and a tubular portion integral with the neck of said member and extending therefrom,

the free end of said tubular portion arranged for receiving a drain hose in a snug fit therewith,

a bracket extending across the flared end of said member, and

a head mounted on said bracket and extending outwardly of said member for receiving a socket in a snug interlocking fit therewith,

whereby the tool mounted socket when pushed over a drain

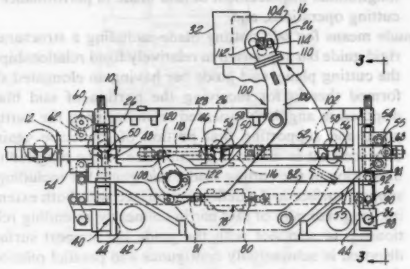
plug and the tool rotated, the socket will loosen and remove the drain plug from the oil pan and said member will receive the oil released by said drain plug.

4,230,003

FEED APPARATUS FOR A LATHE

Joseph A. Oeming, 220 Reynick, Saginaw, Mich. 48602

Filed Jan. 22, 1979, Ser. No. 5,346
Int. Cl.³ B23B *13/00*
U.S. Cl. 82—2.7 **9 Claims**



1. Apparatus for sequentially feeding elongated workpieces to work station of a lathe, said lathe having means for engaging and rotatably driving one workpiece about its longitudinal axis in said work station and means for machining the workpiece in the work station, said apparatus comprising:

conveyor means for sequentially moving said workpiece underneath the work station of at least one lathe; and

means for sequentially moving said workpieces from said conveyor means and to said work station whereupon said lathe engages and machines said workpiece, said moving means being further operable to return said workpiece from the work station and to the conveyor means upon the completion of the machining operation;

wherein said apparatus further includes a frame and wherein said conveyor means is a lift and carry conveyor means and further comprises a pair of spaced and parallel rails having means for supporting workpieces laterally across the rails at predetermined longitudinal intervals, at least two pair of laterally spaced stationary workpiece support members secured to said frame and longitudinally spaced said predetermined distance from each other, means for longitudinally reciprocally moving said rails said predetermined distance, and means for vertically reciprocally moving said rails between an upper and lower position, said rail workpiece support means being positioned above said stationary support members in said upper position and being positioned below said stationary support members in said lower position.

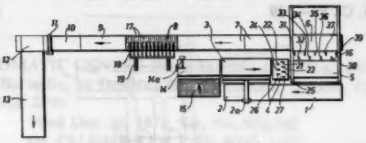
4,230,004

METHOD OF SAWING AND STACKING BOARD

Sven M. Jonson, Sundsvall, Sweden, assignor to Möhög AB, Sundsvall, Sweden

Filed Feb. 27, 1978, Ser. No. 881,854
Claims priority, application Sweden, Mar. 11, 1977, 7702805
Int. Cl.³ B27B *5/06*
U.S. Cl. 83—23 **5 Claims**

1. Method of sawing and stacking board, with the board including first sheets and second sheets each having a longitudinal dimension and a transverse dimension, comprising the steps of moving one first sheet over a first saw table for cutting the sheets in the longitudinal direction and over a second saw table for cutting the sheets in a transverse direction and cutting the one first sheet at least for trimming the longitudinal edges thereof, placing the cut first sheet on the support surface of a stacking table for forming a support for the bottom of a stack, moving a number of second sheets in series over the first saw table and over the second saw table and cutting each of the second sheets at least in one of the longitudinal and transverse directions for forming a plurality of sub-divided second sheets from each one of the second sheets moved over the first and second saw tables, each of the sub-divided second sheets having a combined area size equal to or less than the size of the cut first sheet placed on the support surface, and stacking these smaller sub-divided second sheets, while maintaining their positions in relation to each other, on the cut first sheet lying on the stacking table, so that the cut first sheet thus forms a supporting surface for the sub-divided second sheets cut from said second sheets of board.

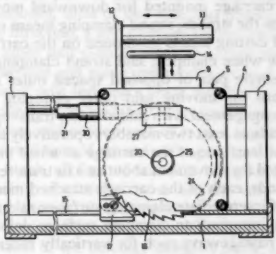


4,230,005

TRAVELING CIRCULAR SAW

Ferenc Varga, Combette 22, 3280 Murten, Switzerland

Filed Jan. 22, 1979, Ser. No. 5,480
Claims priority, application Switzerland, Jan. 2, 1978, 1107/78
Int. Cl.³ B27B *5/18*
U.S. Cl. 83—100 **10 Claims**



2. A cutting machine, particularly for plates of plastic material and non-ferrous metal sheets, having a table for the material to be cut and at least one cutting blade rotatably accommodated in a protecting casing or guard casing, a motor for driving said cutting blade in such a direction that the portion of said cutting blade projecting from the guard casing enters into said guard casing at the cutting place, a rim defining an opening of said guard casing through which said blade projects with very small clearance, said rim thus being closely adjacent said blade at least near said cutting place, said guard casing, cutting blade and motor together defining a cutting unit, first means for shifting said cutting unit longitudinally in a direction parallel to said table and parallel to the plane of said cutting blade for cutting with and resetting of the cutting unit, and second means for shifting said cutting unit in a direction perpendicular to said table and parallel to the plane of said cutting blade for uniformly applying said guard casing with said rim against the material to be cut at least near said cutting place in order to prevent bending and splitting of the material by the cutting forces of said blade entering into the guard casing and for lifting off said cutting unit from said table and from said material to be cut, respectively.

4,230,006

CONTINUOUS CASTING OF METALS

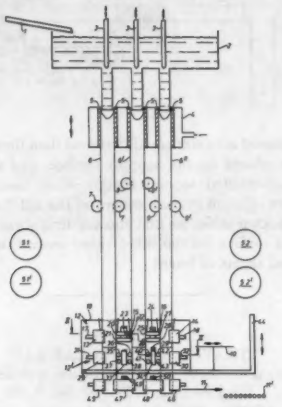
Anthony W. Hudd, Sutton Coldfield, England, assignor to IMI Refiners Limited, Walsall, England

Filed Jan. 17, 1979, Ser. No. 4,192

Claims priority, application United Kingdom, Jan. 17, 1978, 1803/78

Int. Cl.[3] B22D 11/126

U.S. Cl. 83—319 8 Claims



1. A device for cutting into predetermined lengths at least three laterally spaced continuously cast parallel axes metal strands during their downward movement, said device comprising: a carriage mounted for downward movement at the same rate as the strands; strand clamping means on the carriage and strand cutting means positioned on the carriage to cut all the strands when clamped; said strand clamping means comprising a single pair of opposed spaced outer clamping surfaces; means for moving said outer clamping surfaces into operative engagement with said strands, transverse to the axes of the strands; at least two members operatively attached to the carriage; at least one of the carriage attached members pivotally mounted for movement about an axis transverse to the axes of the strands; each of the carriage attached members providing pairs of intermediate clamping surfaces; said two outer and two of the intermediate clamping surfaces defining betweem them two passageways each for vertically receiving one cast metal strand; and said carriage attached members defining between them at least one passageway for receiving a vertically cast metal strand.

4,230,007

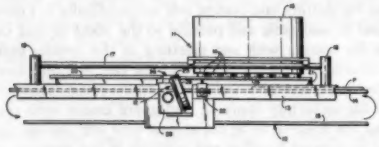
FLEXIBLE MEAT SLICING BLADE AND SUPPORT THEREFOR

James E. Grote, Westerville, and Thomas A. Hochandel, Pickerington, both of Ohio, assignors to J. E. Grote Pepp-A-Matic Co., Inc., Columbus, Ohio

Filed Jul. 27, 1978, Ser. No. 928,509

Int. Cl.[3] B26D 4/42, 4/48

U.S. Cl. 83—409.2 12 Claims



1. A slicing apparatus comprising

slicing means including an elongated flexible cutting blade having a longitudinally extending cutting edge formed along one marginal edge portion of said blade, said cutting edge being formed with a longitudinally extending beveled surface that is angularly disposed at a predetermined angle relative to the plane of the blade, and drive means coupled therewith for support of a longitudinally extending portion of said blade in linearly disposed relationship with the plane of the blade disposed in angularly oriented relationship to a cutting plane and having a longitudinally extending terminal edge of the cutting edge projecting into the cutting plane, said drive means operable to effect longitudinal displacement of said blade in performance of cutting operations, and

guide means for said cutting blade including a structurally rigid guide bar supported in relatively fixed relationship to the cutting plane, said guide bar having an elongated slot formed therein for receiving the portion of said blade disposed in angularly oriented relationship to the cutting plane and supporting that portion of the blade against displacement in either axis transverse to the longitudinal dimension of the cutting blade, said guide bar including a support surface and a deflecting surface with both extending longitudinally of said bar in colinearly extending relationship to said slot with the guide bar support surface disposed in substantially contiguous and parallel relationship to the cutting plane and having said support and deflecting surfaces disposed in relatively divergent relationship to said slot with said slot disposed relative to said guide bar support surface to place the beveled surface of said blade cutting edge adjacent to the cutting plane and in divergently angled relationship to said support surface and cutting plane.

4,230,008

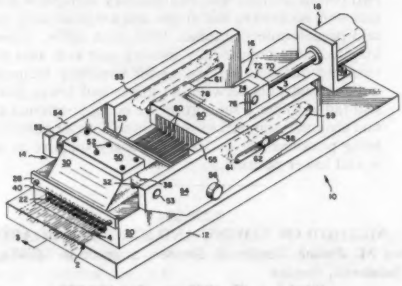
CABLE SPLITTER

Robert G. Fornwalt, Lancaster, and Walter C. Shatto, Jr., Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 19, 1979, Ser. No. 58,642

Int. Cl.[3] B26D 7/02; H02G 1/12

U.S. Cl. 83—456 4 Claims



1. An apparatus for separating selected conductors from the plurality of conductors confined in a ribbon cable, comprising

a cable clamp having upper and lower jaws, said jaws having a plurality of opposed teeth defining a plurality of opposed voids for clamping selected conductors among said plurality of said conductors between said teeth,

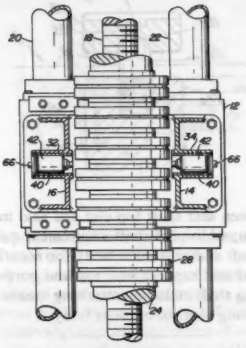
a plurality of splitting blades dimensioned to be received in said voids and having a mean height greater than that of said teeth of said lower jaw, and

drive means for moving said splitting blades along said voids and separating selected conductors.

4,230,009
ROTARY TOOL POSITIONER

Robert E. Coburn, Warminster, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 814,749, Jul. 11, 1977, Pat. No. 4,162,643. This application Feb. 9, 1979, Ser. No. 10,561
Int. Cl.³ B23D *19/06, 35/00*
U.S. Cl. 83—504 7 Claims

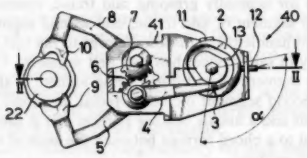


1. In a tool positioner for use in a slitter scorer, the improvement comprising a housing supported by said tool positioner, a cylindrical bearing within said housing, a cylindrical plunger coaxial with and guided by said bearing, the axial length of said plunger being greater than its diameter, said plunger having a pin at one end thereof, a piston coaxial with said plunger and spaced from said one end of said plunger, a piston rod having one end connected to said piston and its other end connected to said one end of said plunger, a stationary cylindrical guide in said housing for guiding said piston, and means for introducing a pressurized fluid to one face of said piston for causing said piston to move in a first direction to a position wherein said plunger pin projects out of said housing to an operative position for contact with a tool.

4,230,010
DEVICE FOR CUTTING GLASS

Franz Guenthner, Mainz, Fed. Rep. of Germany, assignor to Jena Glaswerk Schott & Gen., Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,043
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1978, 2818234
Int. Cl.³ C03B *5/38*
U.S. Cl. 83—600 20 Claims

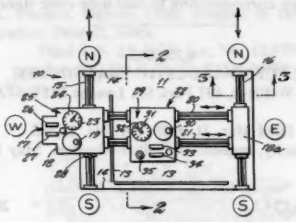


1. In a device for cutting glass, for example for separating a drop or portion of a plastic glass skein emerging from a feeder, said device having two shear arms mounted for rotation in a common frame, each of said shear arms being provided with a knife at its extreme end, and means for periodically rotating the arms to move in a pincher-like closing movement toward one another and awat from one another so that the knives execute a cutting process, the improvements comprising the means for periodically rotating including means for forming a periodic working cycle, said working cycle having two different stages with one stage being a working stage in which the knives execute the cutting process with a temporal sequence of movement which is essentially unalterable in its operating time from a given drive setting and the other stage being an idle time stage in which the glass shears are in an open position and the temporal sequence of movement can be changed within broad limits.

4,230,011
AUTOMATIC CENTER PUNCH FOR TEMPLATES

Luciano Battaglia, 46 Dewlane Dr., Willowdale, Ontario, Canada (M2R 2P8)

Filed Dec. 26, 1978, Ser. No. 973,740
Int. Cl.³ B26D *3/08, 7/26;* B26F *1/02*
U.S. Cl. 83—866 1 Claim



1. An automatic center punch for templates, comprising in combination, a base against which a template blank is positioned, a pair of stops on said base for placement thereagainst by said blank, a first pair of spaced apart rails respectively positioned on opposing sides of said base and forming a track running in a first direction, a first carriage slidable elong one of said rails and a guide unit slidable along the other one of said rails, said first carriage and guide unit rigidly secured together by a second pair of rails forming a track running in a second direction perpendicular to said first direction, a second carriage slidable along said second pair of rails, a precision telescopic punch carried on said second carriage aligned to punch a center in said blank, all four of said rails being substantially identical and being of circular cross section with a notch formed in the top thereof, a crank handle respectively associated with each carriage operating a drive along its respective track for movement of the carriage along its track, a readout gauge respectively associated with each carriage for providing an indication of movement of the carriage along its respective track, and counters for each gauge for counting the number of rotations of a dial within its respective gauge.

4,230,012
MUSICAL INSTRUMENT AND METHOD FOR USE THEREIN

Wolfgang Bommersbach, and Robert A. Dean, Jr., both of Palm Beach, Fla., assignors to Bach Laboratories, Inc., West Palm Beach, Fla.

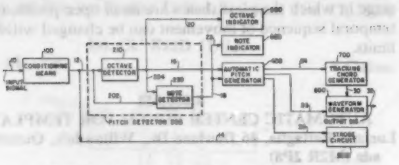
Filed Jun. 14, 1977, Ser. No. 806,484
Int. Cl.³ G10H *1/00;* G10F *1/00;* G10H *1/02;* H04M *1/00*
U.S. Cl. 84—1.01 31 Claims

1. In a musical instrument responding to an applied input signal by producing an output signal including at least one of a plurality of signals of different predetermined pitch, which signals lie in a continuum of octaves and correspond to notes of a musical scale within each octave, the combination of:

an octave detector responsive to said input signal for producing an octave code signal;

a note detector jointly responsive to said input signal and said octave code signal for producing a note code signal, said note detector including frequency shifting means controlled by said octave code signal and operating on

said input signal to shift said input signal into a fixed octave, said note detector determining, within said fixed octave, the note corresponding to said input signal; and



a pitch generator jointly responsive to said octave and note code signals for producing a true pitch signal in the octave corresponding to said octave code signal and having a frequency corresponding to said note code signal.

4,230,013

ELECTRO-ACOUSTIC TRANSDUCER

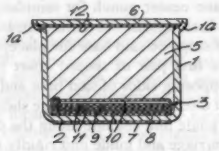
Frederick L. Wellings, 107 Park St., London W1Y 3TA, United Kingdom

Filed Mar. 21, 1979, Ser. No. 22,383

Claims priority, application United Kingdom, May 15, 1978, 19609/78

Int. Cl.³ G10H *3/12*

U.S. Cl. 84—1.14 **20 Claims**



1. An electro-acoustic transducer for providing electrical signals corresponding to sounds in a vibratory surface of a musical instrument, comprising

(a) a relatively flexible body of plastic material;

(b) a relatively rigid support member of plastic material for attachment to a musical instrument on a surface thereof which vibrates in accordance with sound produced by playing of the instrument; and

(c) a capacitor microphone arrangement sandwiched between said support member and said body, said capacitor microphone arrangement comprising

(i) a first electrode comprising an elongate foil of electrically conductive material;

(ii) a second electrode comprising an elongate flat sheath of electrically conductive foil within which said first electrode is received; and

(iii) a dielectric between said electrodes and electrically insulating said electrodes from one another.

4,230,014

SECUREMENT OF GUITAR BRIDGE TO GUITAR BODY

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Ten, Inc., Japan

Filed Jan. 8, 1979, Ser. No. 1,699

Int. Cl.³ G10D *3/04*

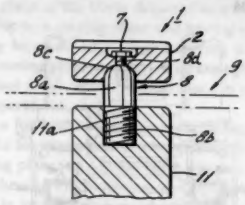
U.S. Cl. 84—299 **10 Claims**

1. A guitar bridge, comprising:

a main body; a support for each guitar string at the top of said main body;

two vertically extending support holes defined in said main body, each for receiving a respective guitar bridge tightening shaft;

a said respective guitar bridge tightening shaft at each said support hole for securing said bridge to a body of a guitar; each said shaft having an upwardly facing top end; each said support hole in said main body having a downwardly facing top end portion inside said main body and which is profiled for engaging said shaft top end, and said bridge and said shaft being held securely together with engagement between said shaft top end and said main body top end portion; additional shaft securement means connecting said shaft and said main body for securing said shaft top end and said support hole top and portion together;



said tightening shaft including attaching means for attaching said tightening shaft to a guitar body.

4,230,015

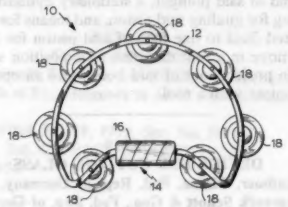
TAMBORINE

Richard L. Taninbaum, 218 W. Boston Post Rd., Mamaroneck, N.Y. 15043

Filed Aug. 31, 1978, Ser. No. 938,502

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—418 **2 Claims**



1. An improved tamborine, comprising:

a rigid, enclosed jingle supporting frame;

a plurality of pairs of percussion jingles connected in pairs to said frame at predetermined locations about a first segment of said frame; and

a handle for manually grasping said frame, connected to a second segment of said frame, said second segment bearing said handle being disposed closer to the said center of gravity of said device than said first segment

said first segment of said frame being arcuate in shape, and said second segment including radial, inwardly disposed portions and a handle bearing portion that is substantially parallel to a chord formed between the ends of said arcuate first segment.

4,230,016

FATIGUE RESISTANT FASTENER AND METHOD OF MANUFACTURING JOINTS THEREWITH

Hollis B. Merrell, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

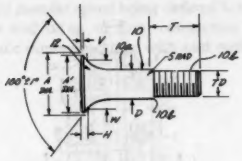
Filed Jul. 31, 1978, Ser. No. 929,519

Int. Cl.² F16B *5/02, 35/04*

U.S. Cl. 85—9 R **12 Claims**

1. For fatigue resistant structural joints, an interference fit,

relatively nondeformable metal, headed, round pin-type fastener cooperable with structural members of relatively deformable metal to be fastened having a round straight fastener receiving hole therein, said fastener comprising an elongated round shank terminating at one end in a fastener head having an underside surface, said shank comprising a main body portion of straight cylindrical configuration larger in diameter than said hole and that terminates at its end opposite the head through a convexly rounded lead-in shoulder and, beyond such



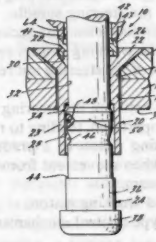
shoulder, in a protruding locking end portion of smaller diameter than said main body portion, said shank main body portion undergoing progressive expansion of diameter from said straight cylindrical configuration through a concave substantially curvilinear profile lengthwise thereof toward the fastener head with a relatively large starting radius of curvature tangential to said cylindrical configuration and continuing therefrom through a final concave curvature of relatively small radius fairing smoothly therewith and with the underside surface of the fastener head.

4,230,017

PULL-TYPE BLIND FASTENER CONSTRUCTION

Donald J. Angelosanto, Huntington Beach, Calif., assignor to Huck Manufacturing Company, Detroit, Mich.

Filed Oct. 12, 1978, Ser. No. 950,827
Int. Cl.³ F16B *13/06*
U.S. Cl. 85—70 **16 Claims**



1. An improved pull-type blind fastener for use in securing a plurality of workpieces together, said fastener being adapted to be set by use of a single action pulling tool having a nose assembly, said fastener comprising:

a tubular sleeve having a preformed head at one end thereof, said preformed head having an enlarged diameter opening provided in the outer end thereof;

a mandrel extending longitudinally through said sleeve and movable with respect thereto in response to a pulling force applied by said tool to form a head on the other end of said tubular sleeve during setting of said fastener, said mandrel further having a lock pocket provided thereon; and

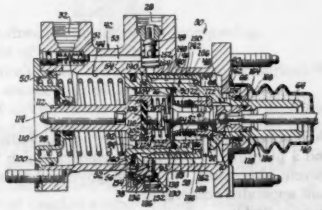
an annular locking collar adapted to be positioned partially within said opening, said annular locking collar surrounding said mandrel and including an inner portion engageable with a portion of said mandrel as said mandrel is moved through said collar member, said portion of said mandrel being disposed axially outwardly from said lock pocket, said annular locking collar being substantially tubular with a substantially constant outside diameter and having at least one end portion engageable with said nose assembly of said installation tool and operative to enable said pulling force to be exerted between said mandrel and said sleeve by said pulling tool so as to form said head, said one end further having a wall thickness less than the wall thickness of said inner portion whereby said one end portion engages said nose assembly in a radially outwardly offset relationship to an opening in said nose assembly whereby said mandrel may be moved through said collar by said pulling tool so as to set said fastener without formation of collar flash.

4,230,018

HYDRAULIC BOOSTER WITH ACCUMULATOR CONTROL

Denny L. Peeples, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1979, Ser. No. 13,879
Int. Cl.³ F01B *25/02*; F15B *20/00*
U.S. Cl. 91—6 **1 Claim**



1. In a hydraulic power booster having an axially movable power piston with a power pressure chamber on one side, a booster control valve for controlling pressure actuation of said booster and having a manually movable valve input element and a valve seat element, said input element being moved relative to said seat element for booster actuation, the improvement comprising:

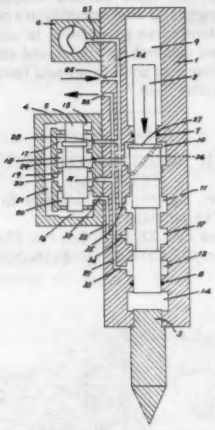
a hydraulic pressure accomulator having a pressure port fluidly connected to said power pressure chamber, a normally closed spring loaded accumulator pressure control valve in said pressure port having a plunger portion extending into said power pressure chamber generally perpendicular to the axis of the power piston, said power piston having a reduced diameter portion extending axially in said power pressure chamber and formed with outer peripheral cam ramp means coaxial with the power piston, and a cylindrical cam mounted radially over said power piston portion with limited radial and axial clearance relative to said power piston and having inner peripheral cam ramp means mateable with said outer peripheral cam ramp means, said valve plunger engaging the outer peripheral wall of said cylindrical cam and normally holding said cylindrical cam in radially offset relation to said power piston portion with only a small peripheral part of said inner and outer peripheral camp ramp means engaged;

said valve input element being movable to drive said valve seat element to enage and drive said cylindrical cam axially relative to said power piston upon demand for booster operation by accumulator pressure, causing said inner and outer peripheral cam ramp means to move said cylindrical cam radially toward a position coaxial with said power piston and driving said valve plunger to open said normally closed spring loaded accumulator pressure control valve and controllably admit accumulator pressure through said port into said power pressure chamber to power actuate said booster by accumulator pressure.

4,230,019
FLUID ARRANGEMENT

Luis M. Castejon Castan, Calle Pablo Casals, 12, Madrid, Spain

Filed Nov. 13, 1978, Ser. No. 959,781
Claims priority, application Spain, Nov. 12, 1977, 464093
Int. Cl.[3] F01B 7/18, 11/02, 25/04; F01L 25/04
U.S. Cl. 91—220 5 Claims



1. A fluid actuating apparatus of the type including a fluid circuit and a plurality of actuating members which have imparted thereto alternating movement governed by said fluid circuit, said apparatus comprising:

a working cylinder;

a working piston mounted for movement in opposite first and second directions within said working cylinder;

a control cylinder;

a control piston mounted for movement in opposite first and second directions within said control cylinder;

a fluid feeding line for a source of fluid under pressure permanently connected to a return chamber in said working cylinder and to a first chamber in said control cylinder;

a working chamber in said working cylinder permanently connected to a second chamber in said control cylinder;

a fluid discharge line for discharging fluid permanently connected to a discharge chamber in said working cylinder and to a third chamber in said control cylinder;

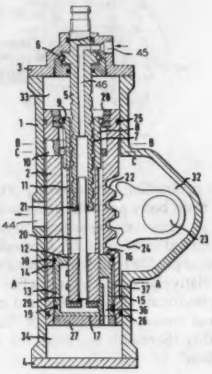
a control chamber in said working cylinder permanently connected to a fourth chamber in said control cylinder; and

said working piston and said control piston each including means cooperating with said working cylinder and said control cylinder, respectively, for opening and closing communication between selected ones of said chambers in said working cylinder and said control cylinder, such that in an initial stage of the cycle of operation of the apparatus said working piston is in a first position thereof adapted to contact a percussion tool and said control piston is in a first position thereof whereat said second and third chambers thereof are in communication, thereby permitting driving of said working piston to a second position thereof spaced from the percussion tool, at which second position of said working piston said return chamber and said control chamber are in communication, thereby causing driving of said control piston to a second position thereof at which said first and second chambers are in communication, thereby causing said working piston to be moved toward said first position thereof to strike the percussion tool, at which first position said control chamber and said discharge chamber are in communication, thereby permitting said control piston to be moved to said first position thereof, whereat the cycle of operation starts anew.

4,230,020
INTEGRAL SERVO STEERING GEAR WITH RACK TRANSMISSION

József Ivony, Hegedüs Gyula utca 50; Imre Lendvai, Árpád utca 35; László Szücs, Batthyanyi utca 14, and József Orbán, Alsohegyi ut 7, all of Budapest, Hungary

Continuation-in-part of Ser. No. 671,298, Mar. 29, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,773
Int. Cl.[2] F15B 9/10, 13/04
U.S. Cl. 91—422 5 Claims



1. Hydraulic servo steering gear comprising

a steering shaft,

a double-acting working piston,

a housing in which said working piston is accommodated,

a rack and sector gear connection between said steering shaft and said working piston,

a steering spindle journalled in said housing which, in operation, is rotated to control steering,

a steering nut, journalled in said working piston, in threaded engagement with the steering spindle,

first and second abutment elements secured relative to the steering nut and the working piston, respectively to limit angular movement of the steering nut relative to the working piston,

resilient means fixed between the steering nut and the working piston and, in operation, tending to restore the steering nut and the working piston to a predetermined relative angular position when movement from the said predetermined position occurs,

a bore defined in said working piston,

a piston and sleeve type control mechanism arranged in said bore,

an inlet communicating with a chamber disposed within the outer periphery of the sleeve, said inlet enabling high pressure liquid to enter said steering gear and thereby reach said chamber,

said housing having an outlet enabling low pressure liquid to leave said steering gear,

an entraining member connecting the steering nut to the piston of the said control mechanism,

securing means positioned to secure said sleeve against angular displacement within said bore of the working piston,

the piston of the control mechanism defining a first channel forming part of a connection between said chamber and a high pressure space at one end of the working piston,

the sleeve of the control mechanism defining a second channel forming part of a connection between said chamber and a further high pressure space at the other end of the working piston,

angular movement of the piston of the said control mechanism relative to the sleeve in one direction tending to connect the first channel but not the second channel to

said inlet for high pressure liquid, and angular movement of the piston of the said control mechanism relative to the sleeve in the other direction tending to connect the second channel but not the first channel to said inlet for high pressure liquid,

the sleeve having a substantially cylindrical outer surface and fitting loosely in said bore in a radial sense, and

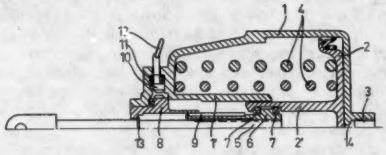
adjacent each end of the control sleeve a respective one of two ring seals is disposed on the outer cylindrical surface of the sleeve to form an annular space due to said loose fitting, said annular space being defined between said two ring seals and being in flow connection with a liquid return space communicating with said outlet.

4,230,021

GOVERNING DEVICE FOR A SPRING BRAKE ACTUATOR

Andre Aurousseau, Argenteuil, and Michel Roger, Ville d'Avray, both of France, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Oct. 11, 1977, Ser. No. 841,045
Claims priority, application Sweden, Oct. 11, 1976, 7611248
Int. Cl.³ F15B *11/08*
U.S. Cl. 91—461 **5 Claims**



1. In a fluid pressure operated system including a spring brake actuator having spring biased clutch means for disengagement of and thereafter automatically restoring engagement of the spring brake actuator when fluid pressure is absent,

governing means supplied with said fluid pressure, comprising in combination, a braking system wherein the spring brake actuator is actuated by fluid supply means for selectively applying fluid at varying pressures for service braking,

a source of fluid supplying said fluid at varying pressure for said service braking and the spring brake actuator,

a pilot valve with a valve-closing prestressed bias spring and pressure actuated pilot diaphragm coupled to said source to admit fluid under pressure to said spring brake actuator when the pilot valve is overcome by maximum prevailing service braking pressure,

an operating device comprising an operating diaphragm,

means supplying on opposite sides of the operating diaphragm service braking pressure and said maximum prevailing pressure,

valve means operated by the diaphragm for giving a clutch disengaging signal when the spring brake actuator pressure is higher than the service braking pressure,

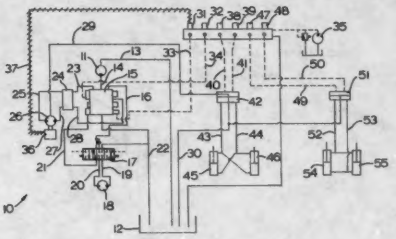
and calibrated nozzle means releasing pressure in said spring brake actuator slowly.

4,230,022

HYDRAULIC ROCK BREAKER CIRCUIT FOR AN EXCAVATOR

Donald L. Bianchetta, Coal City, and Lawrence F. Schexnayder, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 729,527, Oct. 4, 1976, abandoned. This application Jan. 8, 1979, Ser. No. 1,492
Int. Cl.³ F15B *11/16*
U.S. Cl. 91—516 **6 Claims**



1. A hydraulic control system comprising:

a source of pressurized fluid;

first circuit means for communicating pressurized fluid from said source for operation of a first motor;

second circuit means for communicating pressurized fluid from said source for operation of a second motor;

priority valve means disposed between said source and said first and said second circuits for communicating all fluid from said source to said first circuit until the pressure thereof reaches a predetermined minimum and thereafter maintaining said predetermined pressure in said first circuit and communicating all available flow to said second motor, and a dual-stage relief valve for said second circuit, wherein said dual-stage relief valve is conditioned to one of said dual-stages by lubricating pressure in said second motor for preventing high-speed operation of said second motor until lubrication pressure builds up therein; and

wherein said hydraulic control system includes a pressure responsive means responsive to lubricating pressure in said second motor for operating an activation means through an electrical conductor carrying an electrical signal from the pressure responsive means to the activation means, the activation means conditioning the dual-stage relief valve to said one of said dual-stages through a conduit which provides communication between the activation means and a pilot control chamber of the dual-stage relief valve in response to said electrical signal.

4,230,023

CLAMPING APPARATUS

Charles W. Ward, Akron, Ohio, assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 5, 1977, Ser. No. 857,790
Int. Cl.³ F01B *31/12*; F16M *13/00*
U.S. Cl. 92—5 L **15 Claims**

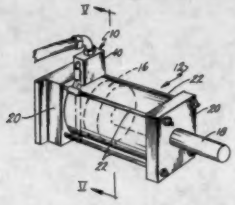
1. In combination, a first object a second object, and a clamping apparatus for securing the first object to said second object, said clamping apparatus comprising:

an elongated, flexible clamping strap having a plurality of spaced, generally transverse slots therethrough;

a clamp member connected to a free end of said clamping strap and contoured to the shape of the second object for positive, secure engagement with the second object;

an adjustment means coupled to said clamping strap for moving said clamping strap in the direction of elongation of said strap to adjust the effective length of said clamping strap between the first and second objects; said adjustment means including a screw with threads engaging said trans-

verse slots of said clamping strap, a mount with an opening securing said screw therein; and an elongated slot in communication with said opening and receiving said clamping strap therein, so that turning said screw causes longitudinal movement of said clamping strap within said slot thereby changing the effective length of said clamping strap between said mount and said clamp member; and securing means coupling said adjustment means to the first object, said securing means including an elongated strap separate from said clamping strap, said separate elongated



strap having first and second ends, permanent securement means for permanently fastening said first end to the exterior of said first object, said mount with said screw including flange means for fixedly securing said mount in a predetermined position at said second end of said separate elongated strap whereby when said clamp member is engaged with the second object, said clamping strap can be tightened or loosened by manipulation of the adjustment means to clamp the first object to or release the first object from the second object.

4,230,024

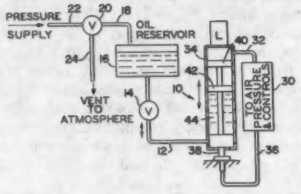
ADJUSTABLE STROKE CYLINDER

Michael L. Becker, Akron, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Jul. 11, 1978, Ser. No. 923,633

Int. Cl.[3] F15B *15/22, 15/24*

U.S. Cl. 92—13.1 **4 Claims**



1. An adjustable stroke piston and cylinder combination comprising:

a cylinder means having closed ends,

a piston with a piston rod secured thereto slidably positioned in said cylinder means,

said piston rod being tubular, having a bore, and extending from one end of said cylinder means,

an auxiliary piston in sealed engagement with said cylinder means and said piston rod,

said piston rod having ports therein connecting its bore to a point intermediate said piston and said auxiliary piston,

liquid supply means connecting to said one end of said cylinder means for supply of liquid under pressure thereto whereby the effective length of said cylinder means can be controlled from one end thereof by moving said auxiliary piston away from said one end of said cylinder means and retaining it in a given position when said piston and piston rod reciprocate in relation to said cylinder means, an adjustable air cushion means being provided in said cylinder; and said auxiliary piston having a bleeder bore therein operatively connecting its axially inner face to said piston rod bore, said air cushion means including a valve controlling fluid flow through said bleeder bore, which valve is accessible from the periphery of said auxiliary piston.

4,230,025

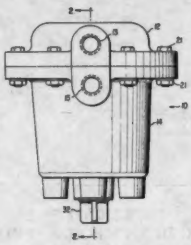
PNEUMATIC ACTUATOR

Charles T. Caliri, Northboro, Mass., assignor to Jamesbury Corporation, Worcester, Mass.

Filed Nov. 2, 1978, Ser. No. 957,073

Int. Cl.[3] F01B *3/04*

U.S. Cl. 92—31 **4 Claims**



1. A pneumatic actuator comprising:

a drive pin coupled to a rotatable drive shaft;

a diaphragm housing formed by an upper housing and a lower housing; a resilient diaphragm;

a cap-shaped diaphragm cam rigidly attached to said resilient diaphragm, said resilient diaphragm being mounted in said housing for restraining torsional movement of said diaphragm cam wherein said diaphragm cam is provided with a pair of opposed arcuate drive slots which engage said drive pin so as to be rotatable in said drive slots such that a linear motion of said diaphragm cam produces a rotational movement of said drive pin and said drive shaft;

said diaphragm cam having at least one correction slot of a particular shape cut through the cam wall at the bottom edge thereof and

said lower housing having at least one correction cam formed at the bottom wall thereof and projecting from same, and beneath said correction slot, said correction cam and said correction slot being normally disengaged from one another, said correction cam having the shape of said correction slot, said correction cam and said correction slot having respective engagable oblique surfaces,

whereby said correction cam is firmly seated in said correction slot when said diaphragm cam descends within said housing; and

whereby rotational movement of said diaphragm cam is corrected and precise rotation of said drive shaft is produced.

4,230,026

RECIPROCATING PISTON DEVICE

E. Dale Hartley, 2700 Jalmia Dr., Los Angeles, Calif. 90046

Filed Oct. 25, 1978, Ser. No. 954,403

Int. Cl.[3] F01B *9/02;* **F16J** *1/14*

U.S. Cl. 92—138 **8 Claims**

1. A reciprocating piston device comprising:

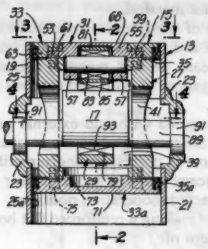
a cylinder;

a piston reciprocable in said cylinder;

said piston including a piston body having a cavity therein, a pivot arm and means for mounting the pivot arm on said piston body for pivotal movement in said cavity, said pivot arm having a passage therein which is within the cavity;

a rotatable drive member in said passage;

means for mounting said rotatable drive member for rotation about a rotational axis in said passage, said rotatable drive member having some throw as it rotates about said rotational axis whereby the rotatable drive member can drive the pivot arm and reciprocate the piston body; and



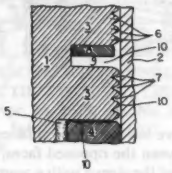
said pivot arm mounting means including an anchor plate mounted on said piston body, a pin extending into said anchor plate and said pivot arm, and bearing means between the pin and the pivot arm.

4,230,027

RECIPROCATING PISTON

Maurice J. Promeyrat, Sevran, France, assignor to Societe Civile Promeyrat-Casteilla-Techniques Nouvelles du Moteur, Gagny, France

Filed Mar. 29, 1978, Ser. No. 891,200
Claims priority, application France, Mar. 28, 1977, 77 09155
Int. Cl.[3] F16J 1/02, 1/08
U.S. Cl. 92—159 **3 Claims**



1. A reciprocating piston for heat engines, compressors and the like including a cooperating piston and a cylinder, comprising:

a piston body including an upper bead, said piston being provided with a transverse annular groove having an inner portion;

a first ring housed in said transverse annular groove, said ring having an upper corner in tangency with the inner wall of said cylinder and a rear inner facing surface spaced from said inner portion of said transverse inner groove;

said upper bead having on its periphery projecting ribs and recessed portions spaced from the inner wall of its said cooperating cylinder, said projecting ribs alternating with said recessed portions;

said upper bead including a decompression chamber above said first ring, said ribs and recessed portions being above and below said decompression chamber, a ring piece housed within said decompression chamber and freely axially movable therein to cooperate with said first ring in response to the movement of said piston in said cylinder; and,

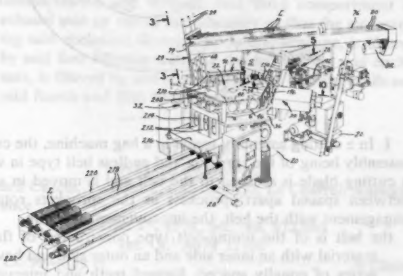
the outer periphery of said ribs having a diameter related to the diameter of the inner wall of said cylinder such that the initial diametrical clearance between said outer rib periphery in its cold condition and said inner wall periphery of said cylinder is substantially equal to half the clearance usually provided with a conventional piston and said inner wall of said cylinder such that during running-in, said projecting ribs being pressed against the inner wall of said cylinder whereby said ribs may contract and be compressed in said recessed portions which absorb said projecting ribs, wherein for a reciprocating piston having a diameter of 75 mm, and when mounted in a four stroke engine, the diameter of a first self-adapted bead of said cooperating piston has a diameter larger by 0.2 mm than that of the conventional piston for said four stroke engine.

4,230,028

MACHINE FOR INSTALLING INSERTS IN CONTAINER LIDS

David S. Knudsen, 3145 Hawthorne Blvd., St. Louis, Mo. 63104

Filed Nov. 22, 1978, Ser. No. 963,011
Int. Cl.[3] B21D 43/18
U.S. Cl. 93—1.3 **21 Claims**



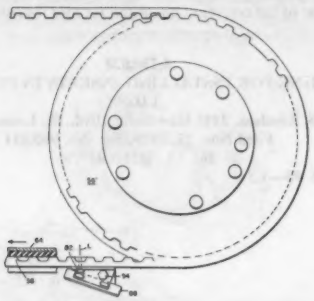
1. A machine for installing a thin, highly flexible insert into a container lid having a closure portion that is sized to extend across and close the mouth of a container and a flange that extends from the closure portion and is configured for engaging the container around its mouth; the closure portion having an inside face that is presented toward the interior of the container when the lid is in place, said machine comprising: backing means for positioning the lid in a predetermined position with the inside face of the closure portion accessible; a retaining member mounted in a fixed position with respect to the backing means and immediately beyond the flange on the lid, the retaining member having an aperture that aligns with the flange, the aperture being slightly smaller than the insert, yet of generally the same peripheral configuration; a plunger having a forwardly presented smooth flat face that is rigid and a plurality of ports which open out of the smooth face near the periphery of the plunger, the plunger having generally the same peripheral configuration as the aperture in the retaining member, yet being smaller than the aperture so that the plunger can fit into the aperture and move toward the closure portion of the lid, the configuration of the aperture and plunger being such that when the plunger is in the aperture, the space between the periphery of the plunger and the wall of the aperture is substantially greater than the thickness of the material of the insert; means for moving the plunger into and out of the aperture; means for placing an insert against the smooth face of the plunger when the plunger is out of the aperture, said means including a blanking punch and a blanking aperture into which the punch moves to blank and insert from a sheet of thin flexible material, the blanking aperture being larger than the aperture in the retaining member; and means for placing the ports of the plunger under a partial vacuum as the plunger advances toward and into the aperture so that atmospheric air holds the insert against the plunger as the plunger moves toward the aperture, whereby the peripheral portion of the insert will be deformed backwardly as the insert passes into the aperture to thereby facilitate its entry into the lid.

4,230,029

CUTTING ASSEMBLY USEFUL IN BAG MACHINES

Charles M. Schott, Jr., Atkinson, N.H., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Oct. 26, 1978, Ser. No. 955,068
Int. Cl.[3] B31B *1/14, 19/14*
U.S. Cl. 93—33 H 4 Claims



1. In a cutting assembly useful in a bag machine, the cutting assembly being of the sprocket and endless belt type in which a cutting blade is secured to the belt and is moved in a path between spaced apart sprockets as the sprockets rotate in engagement with the belt, the improvement wherein,

the belt is of the timing-belt type constructed of flexible material with an inner side and an outer side and having a series of equally spaced, formed teeth and intervening, formed grooves, along its inner side

the sprockets have corresponding grooves and teeth constructed to mate respectively with the teeth and grooves of the belt,

the cutting blade is mounted on the belt by a blade holder disposed on the outside of the belt, a back plate on the inside of the belt, and bolt means extending through the thickness of the belt, joining said blade holder and back plate,

said back plate dimensioned to fit in a single said groove in said belt between a pair of said belt teeth,

said bolt means extend through said belt at only a single location along the longitudinal length of said belt, corresponding to the location of said single groove,

and each of said sprockets has its series of equally spaced teeth interrupted by the omission of a tooth corresponding to the groove of said belt in which said back plate is located.

4,230,030

MACHINE AND METHOD FOR MANUFACTURING SQUARE OR FLAT BOTTOM BAGS HAVING MOVABLE POSITIONS OR STATIONS INCLUDING THE USE OF A MANDREL

Violet M. Hanson, P.O. Box 163, Plainview, N.Y. 11804, and Edgar Strecker, Freeport, N.Y., assignors to Violet M. Hanson, Old Bethpage, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,085
Int. Cl.[2] B31B *33/14*
U.S. Cl. 93—35 SB 44 Claims

1. In an apparatus for forming flat bottom bags from a continuous sleeve of material having opposed faces and sides,

a mandrel adapted for floating and being enclosed within the sleeve of material for rectilinear movement therewithin, said mandrel having relatively movable actuating members,

wings means on said mandrel connected with said actuating members for movement thereby between an expanded operative position and a retracted inoperative position,

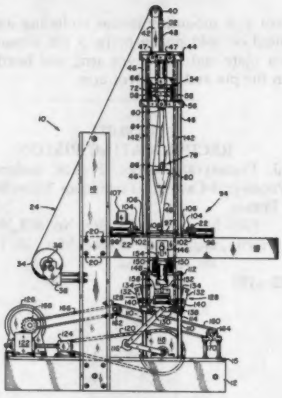
said wings means in said expanded operative position pressing against the interior surfaces of the sleeve of material to open the sides of the same and flattening a portion of the faces of the material to form a flat bottom of a bag and being disposed in said retracted inoperative position substantially remote from the interior surfaces of the sleeve to permit movement of the sleeve of material beyond and relative to said mandrel,

means external of the sleeve of material engaging opposed faces thereof and for actuating said actuating members,

cooperative means on said mandrel actuating members in operative engagement with said external means for actuation thereby,

and means connected with said external means to move at least part of the same rectilinearly to cause said actuating members to move correspondingly rectilinearly to cause said wings means to move between their extended operative and retracted inoperative positions.

35. A method of making a reinforced flat bottom plastic bag comprising the steps of:



providing a sleeve having opposed faces and sides gussetted inwardly between the opposed faces,

closing one end of the sleeve with a seam to seal the opposed faces together with the gussetted sides therebetween,

providing a means exterior of the sleeve and wing-like means interior of the sleeve,

opening the gussetted sides by operating said wing-like means by said means exterior of the sleeve through the faces of the sleeve interposed therebetween such that said wing-like means flatten the gussetted sides against the opposed faces to form flaps of the gussetted sides that have folds lying in overlapping relationship with the opposed faces while moving together the sleeve and said wing-like means included within the sleeve,

and securing together preselected portions of the flaps and the overlapping sides and faces to form a flat bottom by pressing preselected portions of the flaps and the overlying sides and faces together at the preselected portions and heat sealing to secure the same together thereat.

4,230,031

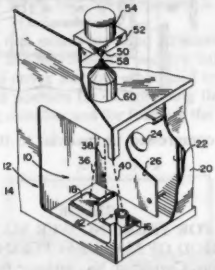
BIOHAZARD CONTAINMENT APPARATUS AND METHOD

Raul I. Pedroso, and Robert E. Auer, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 26, 1978, Ser. No. 900,103
Int. Cl.[3] F23J *11/00*
U.S. Cl. 98—115 LH 6 Claims

1. Method for use in containment of hazardous substances which may be carried in a stream of biological sample flowing in air within a testing chamber, the testing chamber having at

least one face out through which the hazardous substances could move; said method comprising the steps of: establishing a flow of containment air into the chamber through its face and out from the chamber via an exhaust port, the linear face velocity of the containment air flow being sufficient to inhibit hazardous substance movement through the face of the chamber, but of such velocity magnitude to cause detrimental deflection of the biological sample stream if the containment air were to impinge upon the sample stream; and generating an air



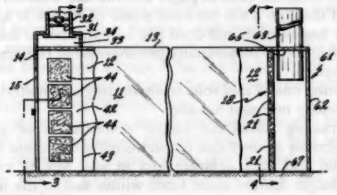
stagnation region which encompasses the sample stream for preventing the containment air flow from causing detrimental deflection of the sample stream, said generating being accomplished by interposing air flow diverting means between the sample stream and the exhaust port and including diverting the containment air flow generally uniformly laterally with respect to the sample stream, by centering the exhaust port relative to the diverting means, said generating being accomplished in the absence of any air flow shielding structure lying between the chamber face and the sample stream.

4,230,032

SPRAY BOOTH WITH VENTILATION

Albert A. Perryman, 11872 W. 207 St., Lakewood, Calif. 90715

Filed Apr. 16, 1979, Ser. No. 30,531
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115 SB **5 Claims**



1. A spray paint booth for a vehicle to be sprayed with paint said booth sitting on a floor and comprising:

a pair of parallelly disposed side walls, a pair of end walls and an overhead forming an enclosure;

one of said end walls having a door opening formed thereon;

a solid door assembly closing said door opening and providing access into said enclosure when said door assembly is open;

a first filtering wall disposed within said enclosure and spaced from and parallel to said other end wall to form an appendage therebetween;

said filtering wall extending to both side walls, said overhead and said floor;

means for allowing air to enter said appendage from a region outside said enclosure and said appendage;

second and third filtering walls disposed at right angles to each other and disposed within said enclosure adjacent said one end wall and on one side of said door opening to form, with said adjacent side wall, a first vertical compartment extending from said floor to said overhead;

fourth and fifth filtering walls disposed at right angles to each other and disposed within said enclosure adjacent said one end wall on the other side of said door opening from said first compartment to form, with said one end wall and said adjacent side wall, a second vertical compartment extending from said floor to said overhead;

a U-shaped member disposed over said overhead and over said first and second compartments to form a third compartment disposed horizontally;

said overhead having a pair of openings disposed over said first and second compartments so that said first, second and third compartments communicate with each other;

a vertical chimney extending from and communicating with said third compartment; and

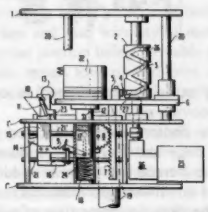
an exhaust fan disposed within said chimney to draw air out of said enclosure through either one of said first or second compartments and through said third compartment to exhaust said air out of said chimney so that the air, entering said enclosure through the said appendage, is filtered by said first filtering wall and the air, leaving said enclosure, is filtered by said second and third filtering walls and said fourth and fifth filtering walls.

4,230,033

INFUSION DEVICE

Bernard Cuccia, Valriant 2, Batiment D3, Le Charrel, Aubagne, France

Filed Dec. 27, 1978, Ser. No. 973,556
Int. Cl.³ A47J *31/00*
U.S. Cl. 99—289 R **9 Claims**



1. A device for automatically producing a coffee infusion by means of a single control for a continuously rotating motor, said device comprising means to proportion a charge of coffee, means to place the charge, means to infuse the charge, means to compress the infused charge so as to form a press cake, and means to eject the press cake; said device further comprising a first cam and a single pinion, and first and second racks, said pinion being arranged so as to simultaneously engage, said first and second racks, and wherein said first rack is adapted to be moved by said cam so as to rotate said pinion thereby moving said second rack, said racks being arranged so as to drive each of said means for sequentially producing said coffee infusion.

4,230,034

APPARATUS FOR CONTINUOUS PRODUCE SURFACE TREATMENT

John H. Amstad, Alameda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed Feb. 12, 1979, Ser. No. 11,391
Int. Cl.³ A23N *7/00*; A47J *17/00*
U.S. Cl. 99—587 **30 Claims**

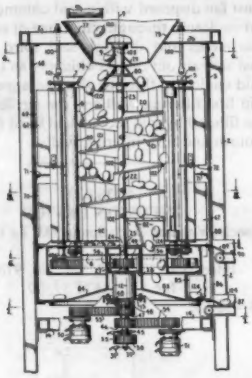
1. Apparatus for removing material from the surface of produce and separating the removed material from the resultant mixture of produce and removed material, comprising:

(a) a housing forming a treating chamber and having an entrance and an exit for produce to be treated;

(b) an upwardly directed cage rotatably mounted in said housing and formed of elongated rotating spindles with a material removing surface thereon,

(c) means rotating said cage in said housing at a rotary speed sufficient, at the interior radius of said cage, to maintain produce in a circular path of rotation and in continuous centrifugal force contact against said material removing surface but insufficient to prevent downward movement of produce within said cage under the force of gravity,

(d) means associated with said housing for urging produce, from which material is to be removed, through said entrance and into said cage and into engagement with said spindles so that said produce is accelerated substantially to said rotary speed within said cage and said produce travels



substantially at said rotary speed in contact with said material removing surface,

(e) a residence control member located at least partially within said cage and having a produce travel resisting upper surface thereon located near said interior radius and resisting said downward gravitational movement, thereby increasing the cage residence time of said produce,

(f) means moving said residence control member relative to said cage so as to functionally lower the position of said travel resisting surface, thereby permitting the lowering of said produce under the force of gravity and controlling the residence time of said produce in said cage, and

(g) means associated with said housing for directing treated produce through said exit.

4,230,035

METHOD FOR IMPROVING TIE MATERIAL TENSION IN PACKAGE TYING MACHINES

Paul Pierce, Jr., LaGrange, and Robert G. Beedy, Hometown, both of Ill., assignors to B. H. Bunn Company, Alsip, Ill.

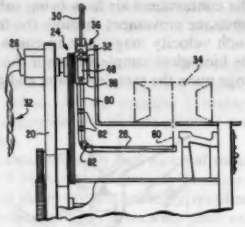
Division of Ser. No. 892,995, Apr. 3, 1978, Pat. No. 4,185,548
This application Sep. 6, 1979, Ser. No. 72,906
Int. Cl.³ B65B *13/10*
U.S. Cl. 100—2 **5 Claims**

1. A method for establishing a substantially uniform tension in the tie material for a package tying machine, the method comprising:

drawing the tie material along a support member;

guiding the supported tie material through a constricted outlet member so as to gather the tie material into a uniform lateral dimension while in an untensioned state;

flexibly compressing the gathered tie material into a uniform cross-section; and



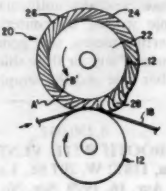
biasing the compressed tie material to thereby tension the same.

4,230,036

NIP ROLL FOR TREATING WEB MATERIALS AND METHOD OF MANUFACTURING SAME

Ernest J. Groome, Covington, Va., assignor to Clupak, Inc., New York, N.Y.

Division of Ser. No. 582,105, May 3, 1975, Pat. No. 3,995,354.
This application Apr. 14, 1976, Ser. No. 676,791
Int. Cl.³ B30B *13/00*
U.S. Cl. 100—35 **4 Claims**



1. In a method of producing asymmetric forces in the plane of web materials such as paper and the like wherein the web is passed through a nip between a pair of rollers at least one of which has an inner roll core and an outer cover member predominantly of a substantially incompressible resilient material, the steps of:

rotating one of said rolls while feeding said material longitudinally into said nip and

restraining substantial elastic deformation of said cover member in only one circumferential direction relative to said roll core adjacent and in said nip by exerting an oblique tension force from within and to the material of said cover member, adjacent the outer surface thereof, in a direction generally tangential to said roll core on one side of said nip whereby pressure between said rollers will displace the material of said cover member toward only said one side of said nip and thereby apply asymmetrical longitudinal forces to said web on opposite sides of said nip.

4,230,037

APPARATUS FOR PROCESSING METAL MATERIAL INTO BALES

Roman Schmalz, Milwaukee, Wis., assignor to Logemann Brothers Company, Milwaukee, Wis.

Filed Mar. 22, 1979, Ser. No. 22,805
Int. Cl.³ B30B *1/32, 15/30*
U.S. Cl. 100—95 **10 Claims**

1. A baling machine comprising

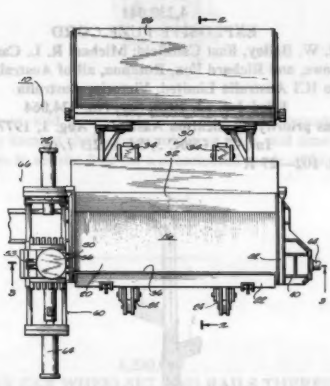
a frame defining a first baling chamber having an open top

and an opening formed in one end, and a second baling chamber communicating with said first baling chamber through said opening;

a cover member pivotally mounted on said frame and movable between an open position permitting access into said first baling chamber through said open top and a closed position covering said open top and sealing said first baling chamber;

feed hopper means mounted on said frame for introducing material to be baled through said open top into said first baling chamber when said cover member is in said open position;

first compression ram means mounted adjacent to said first baling chamber and movable into said first baling chamber underneath said cover member when said cover member is in said closed position for compressing the material in said first baling chamber and for forming the material into



a block with one end section of said block aligned with said opening when said first compression ram means is energized in its compression direction;

feed ram means mounted adjacent to said first baling chamber and movable into said first baling chamber underneath said cover member when said cover member is in said closed position for moving said block end section into said second baling chamber through said opening;

shearing means mounted adjacent to said opening for severing said block end section from the body of said block when said block end is located by said feed ram means in said second baling chamber; and

second compression ram means mounted adjacent to said second baling chamber and movable into said second baling chamber for compressing said severed block end section and for forming said severed block end into a completed bale.

4,230,038

MATRIX PRINT HEAD ASSEMBLY

Donald G. Hebert, San Ramon, Calif., assignor to Helmut Falk, Palo Alto, Calif.

Filed Jun. 23, 1977, Ser. No. 809,423

Int. Cl.³ B41J *3/10, 9/38*

U.S. Cl. 101—93.05 **18 Claims**

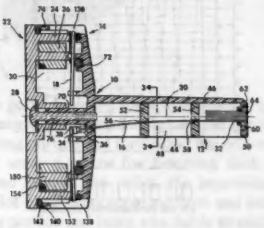
1. A matrix print head assembly comprising:

a number of wire stylus members spaced about a central longitudinal axis and being longitudinally movable between a non-print position and a print position;

guide means for movably supporting said wire stylus members;

a number of rigid armature members equal to the number of wire stylus members movable between a non-print position and a print position and extending radially outwardly of and being circumferentially spaced about the central longitudinal axis with a radially inner portion being driveably engageable with said wire stylus members during movement from the non-print position to the print position to drive the stylus members from the non-print position to the print position;

a number of electromagnet means equal to the number of armature members mounted in juxtaposition to a radially outer portion of said armature members for pivotally supporting said armature members during movement from the non-print position to the print position and being selectively energizable for causing pivotal movement of the radially outer portion of said armature members toward said electromagnet means and opposite pivotal movement of the radially inner portion of said armature members away from said electromagnetic means during movement from the non-print position to the print posi-



tion by magnetic force applied to the radially outer portion;

said armature members being positioned between said electromagnet means and said wire stylus members and said radially innermost portion being movable away from said electromagnetic means toward said wire stylus members during movement from the non-print position to the print position;

first pivotal support means for pivotally supporting said armature members during a first initial portion of the movement of said armature members from the non-print position to the print position; and

second pivotal support means pivotally supporting said armature members during a second terminal portion of the movement of said armature members from the non-print position to the print position.

4,230,039

DRUM PRINTER WITH HELICALLY ARRANGED TYPE SETS

Nagao Mizutani, Hachioji; Toshio Kurihara, Tokorozawa; Yutaka Nishiyama, Higashiyamato; Masao Kunita, Sayama; Teruo Kinoshita, and Makoto Yasunaga, both of Kawagoe, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,614

Claims priority, application Japan, May 20, 1977, 52-57651; May 24, 1977, 52-60204; May 24, 1977, 52-60205; May 24, 1977, 52-50206

Int. Cl.³ B41J *1/24*

U.S. Cl. 101—93.17 **32 Claims**

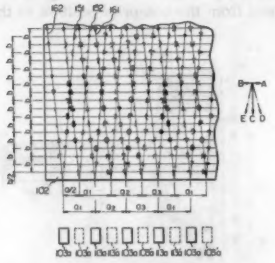
1. A line printer for impact printing upon a recording medium, comprising:

a type drum having at least a first and a second set of type faces formed on an outer cylindrical surface thereof, comprising a first and a second group of characters respectively, said first set of type faces being arranged in a helical path with a clockwise orientation relative to the axis of said type drum and said second set of type faces being arranged in a helical path with a counter-clockwise orientation relative to the drum axis, said helical paths of the

first and second sets of type faces being of identical pitch and lead angle;

means for continuously rotating said type drum about its axis while alternately and repetitively traversing the drum in opposite directions along the drum axis;

a plurality of hammers arranged adjacent to said type drum, in a line which is parallel to said drum axis, with a fixed offset being provided between said hammers, the ratio of said offset between the hammers to said pitch of said helical paths of the type faces being an integer, said hammers being restrained against movement in a direction parallel to the type drum axis during each traverse of said type drum and arranged such that at least a part of said first set of type faces become successively aligned opposite each of said hammers as said type drum rotates during



a traverse of said type drum in a first axial direction and at least a part of said second set of type faces become successively aligned opposite each of said hammers during a traverse of said type drum in a second axial direction opposite to said first axial direction; and

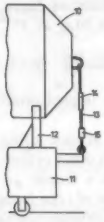
hammer actuating means operated in cooperation with said type drum rotating and traversing means for actuating selected ones of said hammers to impact selected ones of said first set of type faces through the intermediary of said recording medium during a traverse of said type drum in said first axial direction and for actuating selected ones of said hammers to impact selected ones of said second set of type faces during a traverse of said type drum in said second axial direction at appropriate timings for printing a plurality of characters of a print line during each traverse of said type drum.

4,230,040

RELEASING DEVICE

Jan Björk, Bjärred; Jan T. Olsson, Landskrona; Bo S. Lindgren, Sandviken; Arne G. Borg, and Jan A. R. Andersson, both of Lund, all of Sweden, assignors to SAB Industri AB, Malmo, Sweden

Filed Oct. 10, 1978, Ser. No. 949,988
Claims priority, application Sweden, Oct. 10, 1977, 7711322
Int. Cl.[3] F42B *22/16*
U.S. Cl. 102—13 **4 Claims**



1. A releasing device used for disconnecting a buoyant body from an anchor a predetermined period after the body tied to the anchor by said device has been sunk into water comprising in combination, a cylinder and a piston reciprocably movable therein forming first and second cylinder spaces on opposite sides of the piston, each of said spaces being connected to the surroundings by respective first and second passages, the first passage having a considerably smaller cross-sectional area than the second passage, spring means biasing the piston for movement toward the second space, latching means arresting movement of the piston toward the second space and disengagable by movement of the piston against the spring bias, connecting means connecting the body and the anchor respectively at opposite ends of the cylinder, and first means for disconnecting one of the body and the anchor from the cylinder at the respective one of said connecting means when the piston is displaced towards the second space.

4,230,041

EXPLOSIVE FUZE CORD

John R. W. Bailey, East Caulfield; Michael R. L. Carter, Templestowe, and Richard Fox, Rosanna, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Jul. 12, 1978, Ser. No. 924,064
Claims priority, application Australia, Aug. 1, 1977, PD1055
Int. Cl.[3] C06C *5/04*; F42D *1/04*
U.S. Cl. 102—27 R **16 Claims**

1. In a fusecord of the kind commonly employed for the transmission of detonation or flame in blasting and prospecting operations and comprising a core of explosive or incendiary material surrounded by non-explosive wrapping material and wherein said wrapped core is encased by a casing comprising a thermoplastic sheath a part at least of which is enclosed by flexible strands the improvement wherein the said strands are adhered to the said sheath by an amount of adhesive component derived from a water-bearing adhesive composition selected from the group consisting of rubber, epoxy resins, acrylic compounds and polymeric vinyl materials.

4,230,042

POINT-DETONATING IMPACT FUZE

Dragolyoub Popovitch, 37 Myers Ave., Denville, N.J. 07834

Filed Jul. 26, 1978, Ser. No. 927,126
Int. Cl.[3] F42C *9/00, 9/14*
U.S. Cl. 102—233 **13 Claims**

1. A point-detonating impact fuze for spin-stabilized projectiles, having a two-piece body and comprising:

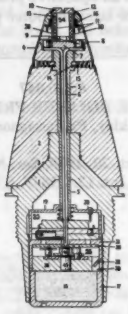
a point-detonating module housed in the upper portion of said two-piece body including an axially located shaft;

a time-delay module housed in the lower portion of said two-piece body having means for setting a preselected mode of function;

a safing and arming module housed in the lower portion of said two-piece body below said time-delay module;

said axially located shaft communicating said point-detonating module with said time-delay module and said safing and arming module;

an explosive train located in said modules and inside said shaft;



a means in said point-detonating module to engage said axially located shaft communicating with said time-delay module to set the fuze for a preselected mode of function.

4,230,043

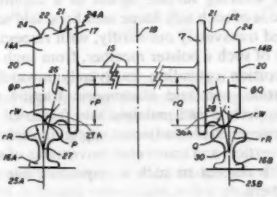
RAILWAY CAR WHEELSET AND RAILS THEREFORE

Thomas Aldington, 13 Oxford Ct., New Hartford, N.Y. 13413

Filed Mar. 24, 1978, Ser. No. 889,881

Int. Cl.[2] B60P *17/00*; B61F *13/00*; F16H *19/00, 55/00*

U.S. Cl. 104—1 A **6 Claims**



1. A railway car wheel having a basically frusto-conical shape, the wheel having inner and outer sides, the wheel being formed with an annular curved convex protrusion extending radially outward from the basic frusto-conical shape at a location intermediate the inner and outer sides of the wheel, said annular curved convex protrusion forming the tread surface of the wheel.

3. In combination, a railway car wheelset and a pair of rails forming a railway track, the wheelset comprising an axle and a pair of variable diametered wheels of substantially frusto-conical configuration each having an inner and an outer side, the wheels being adapted to roll on the rails and being respectively secured at their inner sides to the opposite ends of the axle for rolling in unison therewith, each of the track rails having a crowned rolling surface, the tread surface of each wheel being formed with an annular curved convex protrusion, the gage tolerance of the wheelset being within the gage tolerance of the rails of the track.

4,230,044

AIRCRAFT PALLET FOR OVER-HANGING LOAD

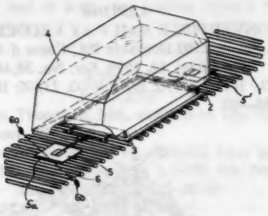
Eberhard Röhrig, Kiefernweg 13, 6941 Gorxheimer-Tal, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,346

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2631378

Int. Cl.[3] B65G *49/00*

U.S. Cl. 104—135 **6 Claims**



1. An aircraft pallet having a main load-bearing portion for use with overhanging loads extending beyond the boundaries of the load-bearing portion and for further use on a roller track which includes sensing means for detecting such overhung loads that extend beyond the pallet, the improvement of at least one flat pilot plate being separate from and not a part of the load-bearing portion and being attachable to said portion in approximate alignment with the pallet bottom and extending beyond a side, a front, or a rear end of the pallet to simulate a larger extension and dimension of the pallet for cooperation with the sensing means.

4,230,045

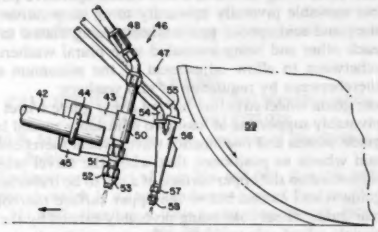
METHOD AND SYSTEM FOR INCREASING THE TRACK-TO-WHEEL FRICTION OF THE WHEELS OF A LOCOMOTIVE FOR MOTIVE POWER AND DECREASING THE ROLLING RESISTANCE FOR TRAILING LOADS

Joseph G. Fearon, Boise, Id., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Sep. 7, 1978, Ser. No. 940,460

Int. Cl.[3] B61F *19/00*

U.S. Cl. 104—279 **7 Claims**



1. A system for maximizing the track-to-wheel adhesion and minimizing the rolling resistance of the wheels of a locomotive, comprising:

a jet nozzle positioned directly above the contact surface of the track immediately forward of the driven wheels of the locomotive;

a high pressure pump connected to the nozzle assembly delivering water at a pressure of at least 4,000 psi to the jet nozzle,

water storage means holding a supply of water for delivery to the high pressure pump,

valve control means controlling the delivery of water to the jet nozzle, and

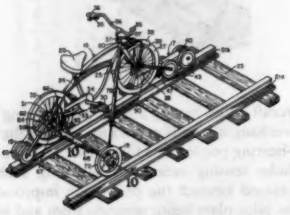
means for ejecting a high pressure gas onto the same contact surface of the rails forward of the driven wheels of the locomotive and immediately following the means for ejecting high pressure water for drying and conditioning the wheel contact surfaces of the rail to assure maximum adhesion of the locomotive wheels thereto and minimize the rolling resistance of the locomotive wheels thereon.

4,230,046

CONVERTIBLE RAILWAY VELOCIPEDE

Richard C. Smart, 3502 Buckskin Rd., Coeur d'Alene, Id. 83814

Filed May 14, 1979, Ser. No. 38,486
Int. Cl.³ B61D *15/10;* **B61F** *9/00, 13/00;* **B62H** *1/12*
U.S. Cl. 105—95 **4 Claims**



1. A bicycle, having a medial frame rotatably mounting a rear wheel on a rear wheel axle and pivotably carrying a front wheel fork that rotatably mounts a front wheel on a front wheel axle, with movably mounted appurtenant structures to adapt for travel on railroad trackage having two spaced rails, comprising, in combination:

a forward guide wheel structure having a foward guide wheel truck rotatably supporting at least two adjustably spaced larger guide wheels and one smaller travel wheel therebetween said wheels so positioned that when the travel wheel is supported on an upper surface of a rail to be traversed the guide wheels extend therebelow on each side of said rail, said guide wheel truck being mounted on a yoke pivotably supported by the front wheel axle of a bicycle and extending forwardly therefrom to carry the forward guide wheel truck immediately radially outwardly of the periphery of the front wheel of the bicycle, said yoke being biased to a downward operative position but movable pivotally upwardly to an inoperative position, and said spaced guide wheels being biased toward each other and being journaled with plural washers therebetween to allow adjustment of the minumum space therebetween by regulation of said washers;

a rear guide wheel structure having a rear guide wheel yoke pivotably supporting at least two adjustably spaced larger guide wheels and one smaller travel wheel therebetween, said wheels so positioned that when the travel wheel is supported on the upper surface of a rail to be traversed the guide wheel extend below the upper surface thereof, sid rear guide wheel yoke being pivotably carried by the rear bicycle wheel axle to support the rear guide wheel structure immediately radially outwardly at the periphery of the rear wheel of the bicycle, and being biased to a downward position but pivotably movable and releasably maintainable in an inoperative upward position, and said spaced guide wheels being biased toward each other and being journaled with plural washers therebetween to allow adjustment of the minimum space therebetween by regulation of said washers;

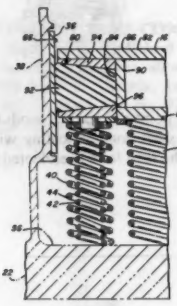
an outrigger wheel structure carried by a rearward outrigger wheel support pivotably mounted upon the bicycle frame adjacent the rear wheel axle, said rear outrigger wheel support being movable from a vertical inoperative position to a horizontal operative position and journaled an outrigger wheel in its outer part to be supported on the rail opposed to that supporting the associated bicycle with a forward outrigger wheel support brace movably mounted on an upper forward position of the bicycle frame extendable from inoperative position along the bicycle frame to an operative position releasably communicating with the laterally outer portion of the outrigger wheel support.

4,230,047

RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Filed Oct. 20, 1978, Ser. No. 953,012
Int. Cl.³ B60F *3/00*
U.S. Cl. 105—197 D **12 Claims**



1. A railway truck bolster friction assembly adapted to be captively retained within a pocket of an elongated truck bolster member which extends between spaced elongated side frame members of a railway truck vehicle comprising: elastomeric friction means adapted to have a first portion thereof in communication with adjacent surfaces of such a pocket and a second portion thereof in frictional engagement with adjacent portions of wearing surface means of a column guide of a respective one of such side frame members, said second portion being spaced transversly outwardly, with respect to the longitudinal axis of such a bolster member, from such a pocket and said first portion extending transversly inwardly from said second portion; and said elastomeric friction means being operative to deform and maintain said frictional engagement, without slipping between adjacent engaging surfaces, during at least initial vertical and transverse movements of such a bolster member with respect to such a respective one of such side frame members.

4,230,048

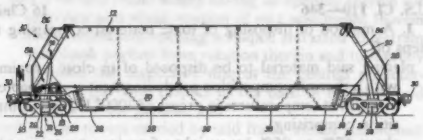
RAILROAD CAR

Robert Gordon, Arcadia; Oscar Weingart, Riverside; Harry A. King, Yorba Linda, all of Calif., and James V. Springrose, Edina, Minn., assignors to Structural Composite Industries, Inc., Azusa, Calif. and Cargill Incorporated, Minneapolis, Minn.

Filed Nov. 14, 1977, Ser. No. 851,154
Int. Cl.² B61D *7/02*
U.S. Cl. 105—248 **20 Claims**

1. A railroad car having an elongated cylindrical car body formed of thin cylindrical longitudinal walls and closed at the ends by respective end walls, a coupler at each end of said car body for coupling the car to other cars, a truck at each end of said car body, and a supporting structure pivotally mounted on each of said trucks for supporting said car body on the respective truck for transport on rails, each of said supporting structures comprising

structural members connecting a respective one of said couplers to the ends of said cylindrical walls at locations substantially balanced vertically and horizontally from the line between the couplers for transmitting forces substantially horizontally from the coupler to the car body, said locations being balanced in the sense that force applied longitudinally at said coupler produces a relatively small net torque on the car body, and bolster means connected to said structural members, extending upward from the



respective truck, and connected to the distal end of a respective one of said end walls above said locations for transmitting forces substantially vertically to said end wall at its distal end to support said car body vertically from said respective truck substantially exclusively at the extreme end of the car body while applying relatively small forces longitudinally to the car body,

said car body being substantially self-supporting between said supporting structures and transmitting substantially all horizontal forces transmitted between said couplers.

4,230,049

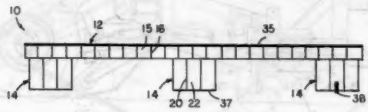
COMPOSITE STRUCTURAL SYSTEM AND METHOD AND APPLICATIONS TO PALLETS AND PLATFORMS

Fred H. Horne, Rye, N.H., assignor to Ellis Paperboard Products, Inc., Portland, Me.

Filed Feb. 12, 1979, Ser. No. 11,229

Int. Cl.[3] B65D *19/32, 19/34;* **B32B** *23/08;* **B05D** *7/00*

U.S. Cl. 108—51.1 **34 Claims**



15. A pallet structure of the type having a deck for supporting a load, and legs spacing the deck from ground to permit entry of fork lift tines for lifting the pallet and supported load, said deck affording a bridge across the legs, the improvement comprising:

said deck and legs comprised of an interpenetrating network composite including two phases, a first phase comprising a substrate of intersecting partitions of absorbent fiber-like material forming a continuous phase fibrous network said intersecting partitions defining a cellular lattice, and a second phase comprising a polymerized plastic material extending throughout and filling the voids and interstices of the fibrous network of the fiber-like material first phase, said second phase derived by in situ polymerization from a solvolysis system including at least a dissolved starting polymer substance and solvent in which the solvent reacts with the dissolved substance, said solvolysis system adapted for saturating and penetrating rather than merely coating the interstices and voids of the fiber-like material first phase, and for reacting and polymerizing throughout the fibrous network of the first phase;

said deck and legs comprised of the interpenetrating composite of fiber-like material and plastic material also formed with at least one laminate coating of an agglomerating plastic material adherent and chemically bonding to the surface of said plastic material and substrate composite and forming thickened weld joints at the intersections of the substrate partitions, said at least one laminate coating derived by in situ polymerization from a similar solvolysis system adjusted to have agglomerative characteristics for coating rather than saturating, and for forming thickened weld joints or fillets at the intersections of the cellular lattice structure, said adjusted solvolysis system adapted to liquify the outer surface of the composite for chemical bonding and interpolymerization between the coating and the composite said at least one coating formed over the deck and legs as a whole, whereby said cellular lattice composite and at least one coating form a monolithic pallet structure.

4,230,050

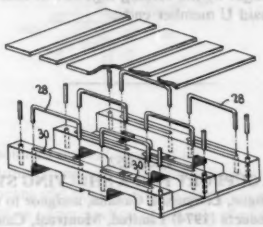
PALLETS

Gerald F. Mays, Timonium, Md., assignor to The Nelson Company, Baltimore, Md.

Continuation-in-part of Ser. No. 796,652, May 13, 1977, abandoned. This application May 3, 1979, Ser. No. 35,441

Int. Cl.[2] B65D *19/26, 19/40*

U.S. Cl. 108—51.1 **17 Claims**



15. A pallet for material transport to be handled with a fork lift truck comprising a plurality of longitudinally extending stringers, transverse deckboards fixedly secured to said stringers, at least the outermost stringers of said plurality of stringers being wooden and having drilled holes at each end thereof and a reinforcing pin in each of said drilled hole enclosed and interlocked within said stringer, and said pin in said drilled hole in interlocking relation with said stringer being of a diameter sufficient to arrest cleavage of said stringer when said stringer is struck by the tine of a fork lift truck, and said pin having a surface sufficiently smooth to enable relative movement between split stringer parts and said pin subsequent to any such cleavage so as to permit repeated repair of a stringer by the forcing together of cleaved stringer parts around said pin.

4,230,051

PALLETS WITH CARGO POSITIONING AND RETAINING STRUCTURE

Gerald F. Mays, Timonium, Md., assignor to The Nelson Company, Baltimore, Md.

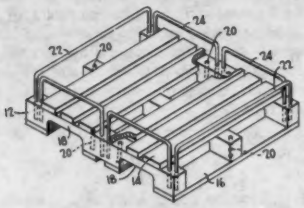
Continuation-in-part of Ser. No. 834,064, Sep. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 796,652, May 13, 1977, abandoned. This application May 3, 1979, Ser. No. 35,442

Int. Cl.[2] B65D *19/26, 19/40, 19/44*

U.S. Cl. 108—55.1 **6 Claims**

1. A pallet having two ends and two sides for material transport to be handled with a forklift truck comprising a plurality of longitudinally extending solid wooden stringers, transverse top deckboards fixedly secured to said longitudinally extending stringers and at least two U members positioned opposite of each other, the ends of said U members fitted into drilled holes in said stringers and extending vertically into and substantially completely through said stringers in at least a semi-permanent fit, and said U member being constructed and arranged with said stringers and deckboards to extend a distance above said top deckboard sufficient to position and retain cargo on said

pallet without passing through said deckboards, the ends of said U members fitted into said drilled holes in said stringers being of a diameter sufficient to arrest cleavage of said stringer when said stringer is struck by the tine of a forklift truck, and



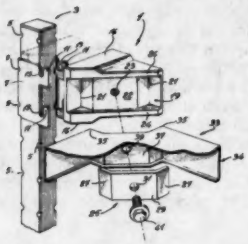
said ends having a surface sufficiently smooth to enable relative movement between split stringer parts and said U member ends subsequent to any such cleavage so as to permit repeated repair of a stringer by the forcing together of cleaved stringer parts around said U member ends.

4,230,052

CORNER SUPPORT FOR A SHELVING SYSTEM

Gaston Champagne, Longueuil, Canada, assignor to Cogan Wire & Metal Products (1974) Limited, Montreal, Canada

Filed May 10, 1979, Ser. No. 37,760
Int. Cl.³ A47F 5/10
U.S. Cl. 108—144 **5 Claims**



1. A corner support for a shelving system; said shelving system including a corner post at each corner thereof, and a holding means on each said corner post, each said holding means including, at one end thereof, upwardly extending side arms defining respective, vertically spaced, sets of notches, and at least one shelf having generally truncated corners and a downwardly depending portion at at least each corner thereof; said corner support comprising:

a generally triangular shape when seen in top view;

a rear end formed at one of the legs of the triangular shape;

a front end formed at another one of the legs of the triangular shape;

vertically spaced bars disposed across said rear end, the spacing between said bars corresponding to the spacing between said sets of notches; and

means at said front end for receiving a respective depending portion at a respective corner of said shelf;

whereby, each corner support is held at and supported by a respective holding means, and, in turn, holds and supports a respective corner of said shelf.

4,230,053

METHOD OF DISPOSING OF TOXIC SUBSTANCES

Paul A. Deardorff, 1128 Dix, Lincoln Park, Mich. 48146; Robert C. Wood, 36002 Huron River Dr., New Boston, Mich. 48164, and Sante M. Cundari, 530 Woodcrest, Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 923,054, Jul. 10, 1978, which is a continuation-in-part of Ser. No. 901,492, May 1, 1978. This application Feb. 5, 1979, Ser. No. 9,108
Int. Cl.³ F23G 7/00
U.S. Cl. 110—346 **16 Claims**

1. A method of disposing of toxic material comprising the steps of:

placing said material to be disposed of in close proximity with a thermit composition producing heat and capable of reaction at temperatures in excess of 3000° F., said composition comprising

about 50% to 95% by weight of an iron-containing by-product from the production of steel; a mineral acid; about 10% to about 25% by weight pulverulent reducing metal selected from the group consisting of aluminum, magnesium, and manganese; and water; and

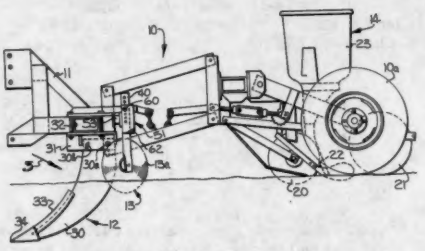
reacting said composition to dispose of said material by heating at least a portion of said composition to about 3000° F. to initiate reaction whereby said composition reacts at temperatures in excess of 3000° F. thereby heating said material so as to decompose said material.

4,230,054

EARTH-WORKING IMPLEMENT

John C. Hatcher, 7525 Valleybrook Rd., Charlotte, N.C. 28211

Filed Aug. 16, 1978, Ser. No. 934,188
Int. Cl.³ A01C 5/04
U.S. Cl. 111—62 **2 Claims**



1. A combination earth-working and seed planting implement comprising:

frame means adapted to be moved over the ground by a propelling means, such as a tractor,

at least one subsoil plow means including a plate-like stock carried by said frame means and provided with a downwardly and forwardly curved forward cutting edge terminating in a substantially pointed tip at a given level below said frame means,

a pair of cutting discs spaced one from the other and positioned to straddle the forward path of travel of said stock during earth-working by the implement, said discs being inwardly concave and forwardly diverging relative to each other and with respect to said path of travel and each disc being located rearwardly of said stock with the lower extremities of said discs being spaced above said given level of said tip so as to aid in leveling and smoothing the soil upset by said stock,

means rotatably supporting each cutting disc to maintain the same in a predetermined position during operation of the implement and including

elongate mounting post means positioned with a longitudinal axis thereof substantially vertical and having a non-circular cross-sectional configuration,

said mounting post means being twisted intermediae its ends to form an upper shank portion and a lower disc-mountig portion thereof with said lower portion extending in substantially axial alignment with said shank portion and at a predetermined radial angle relative to said shank portion by virtue of the twist in said post means,

shaft means extending radially outwardly from said lower portion of said post means and rotatably supporting the respective disc thereon, and

means on said frame means having an opening therein for receiving said shank portion of said post means therein and wherein said opening is shaped and sized to restrain said shank portion from rotation therein and to thereby maintain the respective disc at the desired predetermined angle with respect to the path of travel of said stock over the ground, and

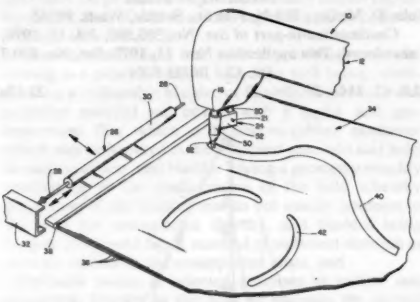
seed planter means carried by said frame means and including furrow opening means spaced rearwardly of said discs and being positioned along the path of travel of said stock so as to form a planting furrow in the soil leveled and smoothed by said discs, and seed dispensing means for depositing seeds into the furrow rearwardly of said discs.

4,230,055

MATERIAL HOLD-DOWN

Gerhard P. Kaempfer, Wyoming, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.

Filed Apr. 18, 1979, Ser. No. 31,190
Int. Cl.[2] D05B *29/04*
U.S. Cl. 112—236 **3 Claims**



3. A material hold-down device in combination with a stitching machine having a reciprocal cylindrical needle bar and needle comprising:

a tubular cylindrical bearing sleeve to slidingly receive said needle bar, said sleeve having an open side of less than 180° extent; a mounting portion extending laterally from said sleeve to mount said device to the stitching machine; said sleeve slidably receiving said needle bar, and said needle bar being accessible through said lateral opening; an elongated hollow nose coaxial with said sleeve to receive the reciprocal needle, joined to said sleeve by a frustoconical juncture, and having a material follower surface on the end thereof.

4,230,056

AUTOMATIC THREAD WIPER FOR SEWING MACHINES

Irving H. Steinbach, Glen Rock, N.J., assignor to Glen Manufacturing Company, Glen Rock, N.J.

Filed Aug. 15, 1978, Ser. No. 933,791
Int. Cl.[3] D05B *65/00, 81/00*
U.S. Cl. 112—239 **9 Claims**

1. A thread wiper for a sewing machine, comprising

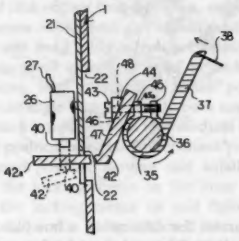
a compact unit adapted to be mounted on the back of an arm of a sewing machine and including a spring biased pneumatic cylinder having a piston, and a solenoid valve operatively connected to said pneumatic cylinder,

a downwardly biased presser foot,

linkage means mounted in the sewing machine for lifting said presser foot upon actuation thereof,

means for actuating said linkage means via extension of said piston in said pneumatic cylinder upon stopping stitching operation of the sewing machine,

a needle having an eye and thread extending therethrough, said needle being mounted in said sewing machine, said thread having a thread tail beginning at the eye of the needle and extending between said presser foot to a cut-off thread end therebelow when said presser foot is in a lifted position,



a holder mounted on said presser foot,

an air jet tube connected from said solenoid valve to said holder means and extending to an open free end of said air jet tube at an upper portion of the sole of said presser foot adjacent and facing said thread tail,

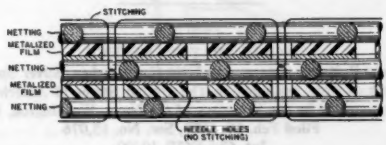
means for deactivating said solenoid valve and retracting said piston in said pneumatic cylinder, and releasing said actuating means, so that said downwardly biased presser foot is released and descends, and simultaneously the exhaust from said pneumatic cylinder jets through said air jet tube, exiting at said open free end thereof, lifting said entire thread tail including said cut-off thread end above the presser foot so that the thread tail is out of the way for the initiation of sewing.

4,230,057

THERMAL INSULATING MATERIAL

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed May 8, 1978, Ser. No. 903,719
Int. Cl.[2] B32B *7/08*
U.S. Cl. 112—420 **1 Claim**



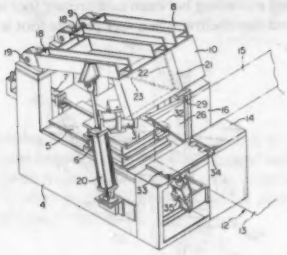
1. A thermal insulating material comprising at least two sheets of polymeric film, each of which is metallized on at least one side, a mesh sandwiched between each adjacent pair of film sheets, an outer mesh on each outside face of the film-mesh sandwich, rows of stitching joining the outer meshes and film-mesh sandwich, and needle perforations through the film sheets to make the material vapor permeable including both perforations made by the needles which stitch the outer meshes and film-mesh sandwich together which are of a size not less than about four diameters of the stitching thread and additional perforations made by non-threaded needles.

4,230,058

METHOD AND APPARATUS FOR MANUFACTURING BOX-SHAPED STRUCTURE FROM METAL SHEET

Takashi Iwaki; Takeji Tanaka; Yoshitomo Tanaka, and Hiroshi Tanaka, all of Kisarazu, Japan, assignors to Yuwa-Sangyo Kabushiki-Kaisha, Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,737
Claims priority, application Japan, Feb. 24, 1978, 53-19720
Int. Cl.³ B21D *51/06*
U.S. Cl. 113—1 R 6 Claims



1. An apparatus for fabricating a box-like metal structure from a channel-shaped metal sheet having a rectangular bottom section and a pair of side sections rising upright from opposite sides of the bottom section, said apparatus comprising:

a main frame;

a bottom support member and a side support member provided on said main frame to support the underside of said bottom section and outer surface of said side section of said channel-shaped metal sheet, respectively;

a clamp arm and a holding arm having the respective outer ends thereof rockably connected to said main frame having a clamp member fixed to the inner end thereof for gripping the bottom and side sections of said channel-shaped metal sheet in cooperation with said bottom and side support members;

a counter die fixedly mounted at the fore end of said holding arm and having a diagonal crease forming groove;

a pressing die mounted in opposing relation with the outer surface of said side section of said channel-shaped metal sheet and having a diagonal crease forming protuberance cooperative with said diagonal crease forming groove of said counter die for forming a diagonal crease in the side-section of said channel-shaped metal sheet; and

an upbending member pivotally mounted on said main frame for upwardly bending an end portion of said bottom section of said channel-shaped metal sheet.

4,230,059

NOISE ABATING SLEEVE

George P. Kalaf, Ashton, and Irvin C. Henschen, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

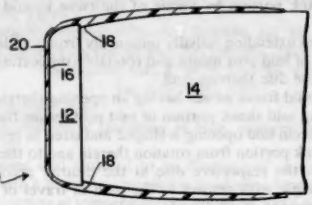
Filed Feb. 26, 1979, Ser. No. 15,076
Int. Cl.³ F42B *19/00*
U.S. Cl. 114—20 R 8 Claims

1. In a torpedo having a nose section formed of an acoustic transducer section affixed to the forward end of a torpedo nose shell, a method for reducing the flow induced self-noise generated by said torpedo as it travels through the water comprising the steps of:

fabricating an elastomeric, acoustically transparent sleeve conforming to the shape of said torpedo nose section, said sleeve having a trailing edge extending well aft of the interface between said transducer section and said nose shell;

installing said sleeve over said torpedo nose section in such a manner that all voids and air bubbles are removed from between said sleeve and the surface of said torpedo;

buffing the surface of said sleeve to obtain the desired level of smoothness; and



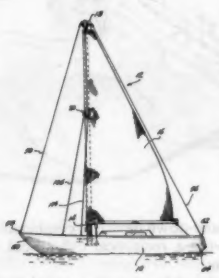
tapering the trailing edge of said sleeve so as to minimize turbulance at the interface between said trailing edge and the surface of said torpedo.

4,230,060

SAILING SYSTEM

John D. McCoy, 719 N. 91st St., Seattle, Wash. 98103

Continuation-in-part of Ser. No. 705,590, Jul. 15, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,711
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—39 22 Claims



1. A sailing system comprising:

an elongated mast;

a mainsail connected to the elongated mast; and

means for mounting the mast onto a boat for 360° rotation about its own axis, and for bracing the mast against buckling, said means comprising a masthead at the upper end of said mast, including first journal means engaging the upper end of the mast and allowing the mast to rotate about its own axis relative to the masthead; second journal means mountable onto a boat hull, for engaging the lower end of the mast and allowing the mast to rotate about its own axis relative to the boat hull; a transverse spreader bar extending crosswise of an intermediate portion of said mast; third journal means between said mast and said spreader bar allowing said mast to rotate about its own axis relative to said spreader bar, but maintaining the spreader bar substantially perpendicular to the mast; and

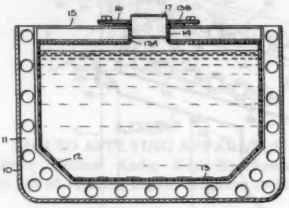
shroud means connectible between the masthead and the spreader bar and a boat hull.

4,230,061

LIQUID CARGO CONTAINER

William M. Roberts, Blauvelt, and Jean Kohn, New York, both of N.Y., assignors to Baltek Corporation, Northvale, N.J.

Continuation-in-part of Ser. No. 786,878, Apr. 12, 1977, Pat. No. 4,101,045. This application Jun. 29, 1978, Ser. No. 920,251
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.[2] B63B *25/08, 25/12;* B65D *25/16, 87/24*
U.S. Cl. 114—74 A 3 Claims



1. A double-tank shipping container for general bulk liquid cargo such as crude oil, said container comprising:

A a single hull sea-going vessel whose liquid-impervious hold has a prismatic formation which is spaced from the hull by a reinforcing frame to define a thermally-uninsulated outer tank capable of independently containing said liquid cargo and serving as a secondary barrier for the liquid, the deck of said vessel having an inlet port communicating with said hold;

B a removable inner tank insertable in said outer tank and serving as a primary barrier, said inner tank being constituted by a collapsible bladder of flexible fabric woven of polyester material and coated with a liquid- and gas-impervious film which is a silicone-rubber elastomer which may be lowered in the collapsed state into said hold through said port, said bladder having a geometry roughly conforming to the configuration of the hold whereby those areas of the bladder that do not exactly conform to the hold are unsupported thereby, said bladder being formed of a coated fabric material of sufficient strength as to resist rupture in the unsupported areas; and

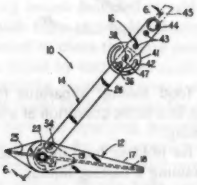
C detachable means at selected positions to anchor said collapsible bladder in the hold to maintain the normal shape of the bladder when it is empty.

4,230,062

RELEASABLE BOAT ANCHOR

Peter J. Fornasiero, 54,638 Starlite, Utica, Mich. 48087

Filed Dec. 12, 1978, Ser. No. 968,793
Int. Cl.[3] B63B *21/38*
U.S. Cl. 114—297 4 Claims



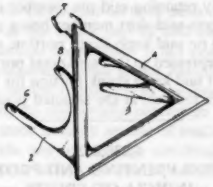
1. An improved releasable boat anchor of the double-acting type for anchoring a boat and for releasing itself from an underwater obstruction in which said anchor may be captured, said anchor comprising a fluke body and a shank, said shank comprising an intermediate portion pivotally connected to said fluke body and an outer portion pivotally connected to said intermediate portion, said outer shank portion having means for attaching an anchor line to said anchor, said anchor having two alternate anchor drag positions, an intermediate release position and a full release position, said intermediate shank portion cosisting of at least one member axially fast and another axially moveable in respect to said fluke body, said axially fast member being pivotally connected at its lower end to said fluke body and at its upper end to said outer shank portion, respective cooperative means on the outer end of said axially moveable member and on said outer shank portion whereby pivotal movement of said outer shank portion controls the axial movement of said moveable member, said intermediate shank portioan being disposed at an acute angle with respect to said fluke body and being axially aligned with said outer shank portion in each of said anchor drag positions, respective cooperative locking means on the inner end of said axially moveable member and on said fluke body which are relatively moved into locking engagement with each other in each of said anchor drag positions, said intermediate shank portion being disposed at an acute angle with respect to both said fluke body and said outer shank portion in said intermediate release position, said angular positioning of said outer shank portion in said intermediate release position moving said axially moveable member so that the locking means on the inner end thereof moves clear of the locking means on said fluke body, said intermediate shank portion being disposed in a substantially straight line position with respect to said fluke body and being axially aligned with said outer shank portion in said full release position, the locking means on said axially moveable member moving behind the locking means on said fluke body in said full release position so that the pull on said fluke body is substantially from the rear thereof.

4,230,063

INFLATABLE AUTOMOBILE WARNING REFLECTOR

Donlly Chang, 1st Fl., 9-2, 20th St., Tien Mu 3rd Rd., Taipei, Taiwan

Filed May 17, 1979, Ser. No. 39,762
Int. Cl.[3] B63C *9/20;* E01F *9/04;* G08G *1/00*
U.S. Cl. 116—63 T 4 Claims



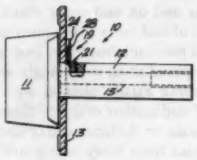
1. An inflatable automobile warning reflector device usable also as a floatation buoy comprising an inflatable triangular body comprising three integral tubular straight sides joined at their ends to define a triangle, reflective material covering a front face of the triangular body formed by said tubular sides, and two integral L-shaped tubular inflatable supports projecting rearwardly from two lower corners of said triangular body to support said triangular body on a surface in an upright position and to receive weights for anchoring said body, and means for inflating said body and supports, said tubular sides forming said body and said supports all communicating with one another for common inflation.

4,230,064

UNIVERSAL T.V. CHANNEL KNOB

Bernard Mack, 1750 NE. 191st St., North Miami Beach, Fla. 33179

Continuation-in-part of Ser. No. 21,359, Mar. 19, 1979, abandoned. This application Dec. 3, 1979, Ser. No. 99,987
Int. Cl.[3] H03J 1/00; F16H 35/18
U.S. Cl. 116—245 7 Claims



1. A control knob assembly for universal replacement of T.V. channel knobs and the like comprising, in combination, a knob bar portion for manual grasping, a cylindrical knob shank portion extending perpendicularly outwardly with respect thereto, said cylindrical knob shank portion being formed of a synthetic plastic material, a coaxial pocket in the outer end of said knob shank portion, said pocket being of "D-shaped" cross-sectional configuration for sliding fit intercoupling with a control shaft of complementary cross-sectional configuration, a circular, disc-shaped, substantially flat skirt member having a central circular opening of such size as to provide for close sliding fit of said skirt member over said knob shank portion, said skirt member being provided, along marginal outer edge portions of one side thereof adjacent the outer periphery, with indicia serving to indicate the rotative setting position of a controlled shaft, and means carried by said skirt member and piercingly receivable within said knob shank portion for fixedly securing said skirt member thereto at any one, selectively, of an infinite number of relatively rotative positions as well as a wide range of relatively longitudinal positions, said skirt member securing means comprising a metal pin member having a pin head portion at one end and a pin point at one other end, means carried by the other side of said skirt member for supporting said pin member and constraining it to radial movement with respect to the axis of generation of said circular skirt member, said pin member being radially axially movable with respect to said skirt member between a first position whereat said pin point is withdrawn from said skirt member central opening, and a second position whereat said point portion projects within said central opening, and means frictionally retaining said pin member in said first position whereby, upon said skirt member being selectively, positionally received on said knob shank portion, said pin member can be radially depressed so that said point portion thereof will be imbedded into said knob shank portion for fixedly securing said skirt member thereto, at the selected position.

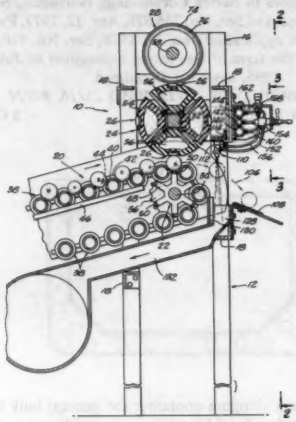
4,230,065

APPARATUS FOR PRINTING AND PROTECTING INK INDICIA ON FRUITS

Ned C. Carter, Chino; Jerry W. Cramer, Upland, and Dennis E. Bilton, Alta Loma, all of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Jul. 31, 1978, Ser. No. 929,264
Int. Cl.[3] B41F 17/34, 35/00, 31/20; B05B 13/2
U.S. Cl. 118—17 3 Claims

1. In apparatus for printing and protecting indicia on an object which apparatus includes a conveyor for conveying objects, said conveyor having a delivery end, a printing station through which said conveyor passes, a printing die at said printing station arranged to print indicia on the upper surface of said objects as they pass through said station and a receiver spaced from said delivery end, said conveyor being arranged to project said objects from said delivery end to said receiver in a free flight path across the space therebetween, said path having a substantial horizontal component, the improvement comprising:



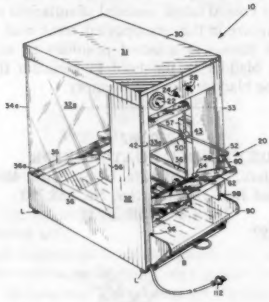
a nozzle over said space and arranged to spray a quick drying transparent material downwardly transversely across said path onto the upper surface of objects projected along said path whereby said material does noot impinge on and contaminate either said conveyor or said receiver.

4,230,066

APPARATUS FOR BASTING AND DISPLAYING FOODS

Charles M. Lents, San Antonio, Tex., assignor to Church's Fried Chicken, Inc., San Antonio, Tex.

Division of Ser. No. 813,954, Jul. 8, 1977, Pat. No. 4,153,736.
This application May 12, 1978, Ser. No. 905,160
Int. Cl.[3] A47J 37/10
U.S. Cl. 118—20 11 Claims



1. An automatic food basting apparatus for maintaining precooked food items in a moist condition at a suitable serving temperature, comprising:

food basting trays for holding food items and a heated basting pan for containing a basting liquid;

basting means for periodically immersing and removing the trays from the heated liquid basting pan to baste food in the trays and drain substantially all the basting liquid from the trays and food item in the trays at a controlled predetermined rate;

said basting tray having a draining means for draining basting liquid from a food item in the tray and the tray after

removing from the basting pan, at a controlled predetermined rate sufficient to provide a predetermined amount of basting of the food item and to control the draining to avoid splashing of the draining basting liquid out of the basting pan; and

the basting trays having means mounting them on the means for periodically immersing and removing to normally maintain the trays in a tilted position relative to the horizontal toward the draining means to drain substantially all of the basting liquid from the trays and a food item therein.

4,230,067

LIQUID APPLYING APPARATUS

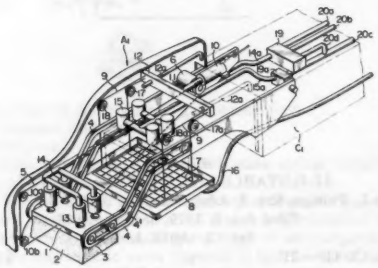
Taro Iwamoto; Shimon Ando; Koji Kurokawa, and Sho Kusumoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 15, 1978, Ser. No. 942,559

Claims priority, application Japan, Sep. 17, 1977, 52-111768; Jan. 27, 1978, 53-7207; Feb. 8, 1978, 53-12456

Int. Cl.³ B05C *1/02*

U.S. Cl. 118—104 **14 Claims**



1. A liquid applying apparatus comprising:

a main body;

a carrier supporting said main body for movement;

liquid applying means mounted on said main body and comprising a surface rubbing means including a liquid-absorptive, resilient contacting member and a supporting member supporting said contacting member, and a spray nozzle means for selectively applying a variety of liquids to a surface of a structure;

liquid feeding means comprising conduit means and valve means for supplying said variety of liquids in predetermined amounts to said liquid applying means; and

liquid removing means mounted in said main body for removing liquids from said liquid-absorptive, resilient contacting member to clean the same prior to an application of a further liquid by said liquid applying means;

said liquid applying means receiving a supply of liquids through said liquid feeding means for cleaning the surface of the structure and applying desired liquids thereto by rubbing the surface by said contacting member as said carrier is actuated, and said liquid removing means being effective to remove liquids from said liquid-absorptive, resilient contacting member by performing a liquid removing operation selectively with a surface cleaning operation and a liquid applying operation performed by said liquid applying means, whereby application of the liquids can be effected automatically with a high degree of efficiency and without any loss of the liquids.

4,230,068

APPARATUS USED IN CONTINUOUS PROCESS FOR ELECTROSTATIC COATING WITH PULVERIZED MATERIAL

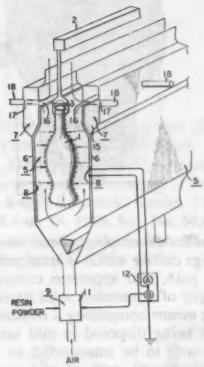
Tsutomu Itoh, Tokyo; Kenji Ouchi; Nobuo Furuya, both of Chiba, and Takeo Shimizu, Chofu, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Oct. 31, 1978, Ser. No. 956,999

Claims priority, application Japan, Jun. 13, 1977, 52-68974

Int. Cl.² 427 *350;* B05B *5/02, 7/14*

U.S. Cl. 118—634 **4 Claims**



1. An apparatus used for continuously electrostatically coating an axially symmetrical object with pulverized synthetic resin, which comprises

(i) an electrostatic coating chamber where said pulverized synthetic resin is coated on the surface of said object maintained at a temperature below the melting point of said resin, which object has been conveyed into said chamber by means of a holding device; said electrostatic coating chamber comprising a long and slender casing permitting the passage of said object therethrough, silent discharge plate electrodes on both sides of said casing, a suction part at the upper part of said casing to recover surplus pulverized resin which is not coated on said object, and a pulverized resin feeder having an electrically precharging device positioned at the lower part of said chamber body to electrically precharge said pulverized resin in the same polarity as that of said silent discharge plate electrode and to feed the electrically pre-charged pulverized material into the lower part of said chamber in such a manner as to flow upwards; said silent discharge being caused on the surface of the plate electrode by applying an AC voltage, and superimposing a DC voltage on the AC voltage to cause a minute discharge current and electric field to flow from the plate electrode to the object being produced; and

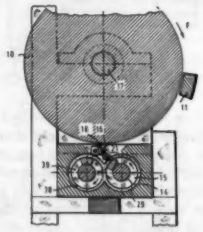
(ii) a device for removing surplus pulverized resin from the specific parts of said object by suction to electrostatically coat the desired part only, said device comprising suction slit openings positioned close to the specific parts of said object from which the surplus pulverized resin is to be removed, and wherein said suction slit openings have squeegees made of an elastic material to facilitate the removal of the surplus pulverized resin.

4,230,069

PARTICLE FEED ARRANGEMENT FOR APPLYING SOLID PARTICLES TO THE IMAGE CARRIER OF A NON-IMPACT PRINTER

Jacques Aldea; Jean-Jacques Eltgen, both of Danjoutin, and Gabriel Thiollier, Belfort, all of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,080
Claims priority, application France, May 16, 1978, 78 14363
Int. Cl.³ G03G *21/00*
U.S. Cl. 118—653 **7 Claims**



1. An apparatus for developing a latent image formed on the surface of an image carrier which is arranged for movement in a predetermined path, said apparatus comprising: a tank for containing a supply of attractable solid particles, first endless screw conveying means comprising a rotatable shaft having a spiral thread and being disposed in said tank so as to cause particles in said tank to be transported to the vicinity of a lowermost position in the path of said image carrier upon rotation of said shaft, a deflector interposed between said endless screw conveying means and said image carrier at said lowermost position, said deflector having two opposite parallel edges of which one is disposed in close proximity to the surface of said image carrier to form, in conjunction with the latter, a trough of generally prismatic shape, the other being disposed in contact with the spiral thread of said endless screw conveying means to cause particles conveyed by said screw conveying means to be collected and accumulated in said trough; and driving means for moving said image carrier in a direction in which it carries particles so accumulated towards said deflector edge which is in close proximity to the surface of said carrier, the distance between said deflector edge and said surface being higher than a first limiting value to allow particles which are carried by said image carrier not to be arrested by said deflector, and lower than a second limiting value in order to prevent the formation of a wave of particles.

4,230,070

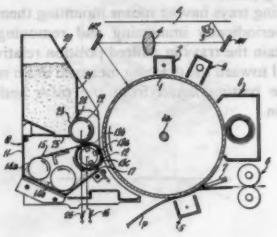
DEVICE FOR AUTOMATICALLY REPLENISHING TONER TO DRY-TYPE DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY

Hiroshi Murasaki, Sakai; Masaya Ogawa, Osaka, and Hidetoshi Kawabata, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1978, Ser. No. 934,121
Claims priority, application Japan, Aug. 24, 1977, 52-113924[U]; Feb. 18, 1978, 53-19827[U]
Int. Cl.² G03G *15/09*
U.S. Cl. 118—658 **16 Claims**

1. In a dry-type developing apparatus for converting electrostatic latent images into visible images with a two-component developer composed of a triboelectrically chargeable toner and a magnetic carrier and conveyed to a developing station by a developing sleeve having a plurality of magnets arranged in its interior, an automatic toner replenishing device comprising:

a roller to which voltage is applied having at least one recessed toner disperser portions and a toner recovering surface portion on its periphery and rotatable in contact with a portion of the developer on said sleeve after the developer portion has passed through the developing station;



means for producing a potential difference between said sleeve and said roller for recovering the toner; and

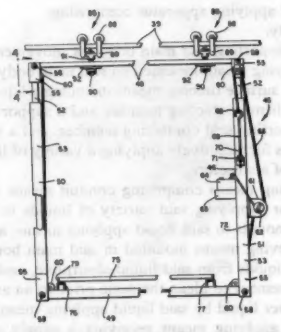
a toner tank arranged to cover part of said roller and containing the toner to be replenished.

4,230,071

ADJUSTABLE EGG CARRIER SYSTEM

Roy L. Phillips, Rte. 3, Adairsville, Ga. 30103

Filed Jan. 8, 1979, Ser. No. 1,875
Int. Cl.³ A01K *31/00*
U.S. Cl. 119—21 **8 Claims**



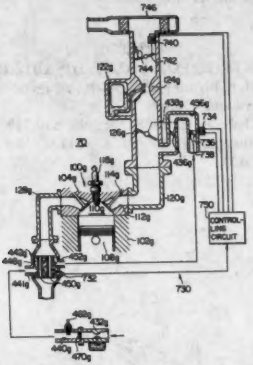
4. An adjustable egg carrier for use on an overhead conveyor rail in a chicken house comprising a framework including an upper cross bar, a lower cross bar below said upper cross bar, a pair of telescoping end bars pivotably connected at their ends to the ends of said upper and lower cross bars, a trolley mounted on each end portion of said upper cross bar for supporting said egg carrier from an overhead conveyor rail, an egg support platform mounted on said lower cross bar, and means for progressively raising and lowering said lower cross bar and said egg support platform with respect to said upper crossbar.

4,230,072

INTERNAL COMBUSTION ENGINE WITH A METHANOL REFORMING SYSTEM

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 913,206, Jun. 6, 1978, abandoned, which is a continuation of Ser. No. 641,603, Dec. 17, 1975, abandoned.
This application Apr. 18, 1979, Ser. No. 31,158
Claims priority, application Japan, Dec. 20, 1974, 49-147057; Aug. 22, 1975, 50-102469; Aug. 26, 1975, 50-103653; Aug. 28, 1975, 50-104804
Int. Cl.[3] F02B *43/08;* F02M *13/06*
U.S. Cl. 123—1 A 7 Claims



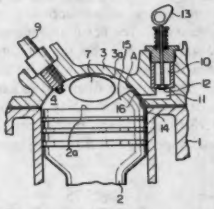
1. An internal combustion engine comprising:
a combustion chamber;
a spark plug;
an intake and exhaust system; said intake system including first and second fuel circuits;
said first fuel circuit comprising a choke valve, a first carburetor disposed in said first fuel circuit downstream of said choke valve for producing a mixture of air and gasoline, and a first throttle valve disposed in said first fuel circuit downstream of said first carburetor;
said second fuel circuit comprising a second carburetor for producing mixture of air and methanol, a catalytic reactor disposed in said second fuel circuit downstream of said second carburetor and containing a catalyst bed so arranged as to be heated by the engine exhaust gases flowing through said exhaust system, a second throttle valve disposed in said second fuel circuit and operatively connected to said first throttle valve for operation therewith, and a shut-off valve disposed in said second fuel circuit to control the communication between said combustion chamber and said second carburetor;
said catalytic reactor being so constructed as to cause the air-methanol mixture to flow through said catalyst bed and being rendered operative to facilitate a catalytic conversion of said air-methanol mixture into a reformed gaseous mixture containing free hydrogen when said catalyst bed is heated to a temperature higher than a predetermined temperature; and
means responsive to the temperature of said catalyst bed to actuate said choke valve and said shut-off valve, the arrangement being such that, when said catalyst bed temperature is below said predetermined temperature, said shut-off valve is closed to render said second carburetor inoperative to produce the air-methanol mixture and said choke valve is at least partially closed to enrich the air-gasoline mixture produced by said first carburetor whereby said combustion chamber is supplied solely with the enriched air-gasoline mixture, and such that, when said catalyst bed temperature is higher than said predetermined temperature, said choke valve is fully opened to increase the air-gasoline ratio of the air-gasoline mixture produced by said first carburetor and said shut-off valve is opened to cause said second carburetor to produce the air-methanol mixture and thus cause said catalytic reactor to produce the reformed gaseous mixture whereby said combustion chamber is supplied with both the lean air-gasoline mixture and the reformed gaseous mixture.

4,230,073

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Sumio Ito, Susono; Hisashi Oki, Numazu, and Teruo Kumai, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 19, 1979, Ser. No. 50,058
Claims priority, application Japan, Oct. 19, 1978, 53-127886
Int. Cl.[2] F02B *41/00*
U.S. Cl. 123—308 9 Claims

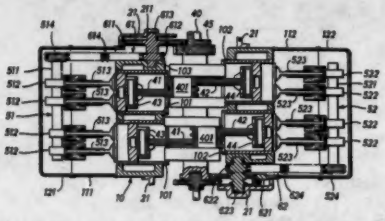


1. An internal combustion engine comprising:
a cylinder block having therein an inner wall defining a cylinder bore;
a cylinder head having an inner wall therein and mounted on said cylinder block;
a piston reciprocally movable in said cylinder bore and having a top face and an upper circumferential wall which is approachable to at least one of a peripheral portion of the inner wall of said cylinder head and an upper portion of the inner wall of said cylinder bore when said piston reaches the top dead center;
a combustion chamber formed between the inner wall of said cylinder head and the top face of said piston;
an intake valve movably mounted on said cylinder head for leading a suction gas into said combustion chamber;
an exhaust valve movably mounted on said cylinder head for discharging an exhaust gas into the atmosphere;
an accumulation chamber formed in said inner wall;
a gas passage communicating said accumulation chamber with said combustion chamber and having an opening which is formed on at least one of the peripheral portion of the inner wall of said cylinder head and the upper portion of the inner wall of said cylinder bore so that said opening is covered by the upper circumferential wall of said piston when said piston reaches the top dead center, and;
a valve means arranged in said gas passage and opened during the compression stroke.

4,230,074
MOTORCYCLE TYPE INTERNAL COMBUSTION ENGINE HAVING OPTIMALLY DISPOSED VALVE ACTUATING MECHANISMS

Satoru Ichikawa, Hamamatsu, and Shunji Minami, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 21, 1978, Ser. No. 944,651
Claims priority, application Japan, Sep. 29, 1977, 52-117206
Int. Cl.³ F02B *75/22, 75/24*
U.S. Cl. 123—55 R **8 Claims**

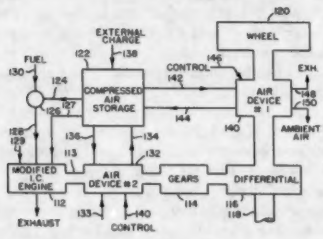


1. An internal combustion engine comprising: a first and a second cylinder bank, each bank having at least one cylinder; a crank shaft having an axis; intake and exhaust valves in each of said cylinders; a piston in each cylinder; a rod assembly connecting each piston to the crank shaft, said cylinders being staggered from bank to bank along said axis, said staggered arrangement leaving a first recess at one axial end of said first bank, and a second recess at the opposite end of said second bank; and a respective valve actuating means for each of said banks including valve motive means for opening and closing said valves, and a first and a second interlocking means, said first interlocking means being disposed in said first recess, and said second interlocking means being disposed in said second recess, said interlocking means being coupled to said crank shaft and to their respective said motive means.

4,230,075
INTERNAL COMBUSTION ENGINE

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Continuation-in-part of Ser. No. 955,895, Oct. 30, 1978, Ser. No. 955,896, Oct. 30, 1978, Ser. No. 926,237, Jul. 20, 1978, Ser. No. 947,998, Oct. 2, 1978, and Ser. No. 970,320, Dec. 18, 1978. This application Dec. 26, 1978, Ser. No. 972,786
Int. Cl.³ F02B *33/00, 75/00*
U.S. Cl. 123—68 **8 Claims**



5. An apparatus comprising:

(a) an internal combustion engine including at least one piston-cylinder-combustion chamber system;

(b) means for compressing air to be fed into said combustion chamber, said compressing means being separate from said internal combustion engine and out of heat exchange contact therewith, and comprising a rotary sliding vane compressor having a pulsed output and means for matching the pulses thereof with the position of said piston in said cylinder,

(c) means for mixing fuel with air to form an air-fuel mixture to be ignited in said combustion chamber;

(d) means for feeding compressed air from said compressor into said combustion chamber;

(e) means for igniting an air-fuel mixture in said combustion chamber;

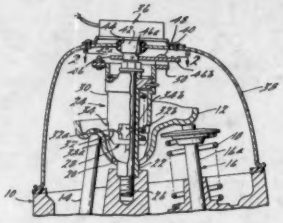
(f) exhaust duct means for feeding hot exhaust gas from said combustion chamber; and

(g) means for regenerating the heat in the hot exhaust gas from said combustion chamber including at least one heat exchanger between said exhaust duct means and said compressed air feeding means.

4,230,076
CONTROL FOR VALVE DISABLERS

Robert S. Mueller, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 5, 1975, Ser. No. 610,719
Int. Cl.³ F02D *13/06;* **F01L** *1/18*
U.S. Cl. 123—90.16 **8 Claims**



1. In an internal combustion engine having means controlling valve disablement of selected intake and exhaust valve pairs, said selected intake and exhaust valves each provided with a valve disabler having means moveable between a valve enabling position and a valve disabling position, said improved control means comprising:

actuator means operative when energized to apply an actuating force tending to move the moveable means of one valve pair to the disabling position and operative to effect such movement when the valves associated with said one valve pair are inactive; and

means interconnecting the moveable means of one valve pair with the moveable means of the other valve pair for effecting movement of the moveable means of the other valve pair to the disabling position in response to movement of the moveable means of said one valve pair to the disabling position, said interconnecting means operative to allow disablement of said one valve pair before disablement of said other valve pair, whereby two valve pairs may be disabled by one actuator without decreasing the time available for moving the disablers to their disabling positions.

4,230,077
VACUUM OPERATED SERVO

Tomo Ito, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 23, 1978, Ser. No. 936,126
Claims priority, application Japan, Aug. 25, 1977, 52-102042
Int. Cl.³ F02D *11/08*
U.S. Cl. 123—389 **9 Claims**

1. A vacuum operated servo comprising:

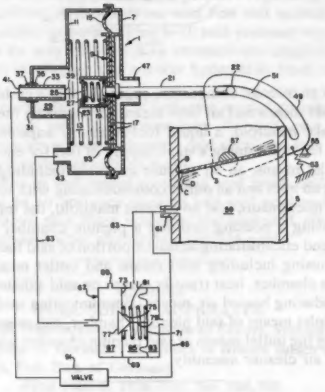
an expansile vacuum chamber;

a flexible diaphragm means defining a part of said expansible vacuum chamber;

open valve means disposed in said vacuum chamber and including a valve body and a valve seat, said valve body being yieldably mounted on said flexible diaphragm means, said valve seat being mounted on a side of said expansible vacuum chamber toward which said flexible diaphragm means is displaceable under action of vacuum supplied to said vacuum chamber, and said open valve means being closed when said flexible diaphragm means is displaced a first predetermined distance;

stopper means associated with said flexible diaphragm means for stopping said flexible diaphragm means when said flexible diaphragm means is displaced a second predetermined distance by said vacuum action, said second predetermined distance being greater than said first predetermined distance;

a first vacuum passage means with a valve means connected between said seat of the open valve means and a vacuum source for communicating the interior of said expansible



vacuum chamber with the vacuum source through said open valve means;

a control valve comprising a casing, a diaphragm, the periphery of which is secured to said casing thereby providing a control valve vacuum chamber, a partition disposed in said control valve vacuum chamber for dividing same into first and second vacuum chambers, and a closed valve means including a valve seat provided in said partition and a valve body secured to the diaphragm of the control valve so that said closed valve is opened when a pressure in said first vacuum chamber reaches a predetermined value, and a leak orifice means provided on said second vacuum chamber for introducing air from the atmosphere into said second chamber;

a second vacuum passage means connected to the interior of said expansible vacuum chamber and the second vacuum chamber of said control valve; and

a third vacuum passage means connected to said first vacuum passage means and the vacuum source.

4,230,078

IGNITION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki, and Hiroaki Yamaguchi, Anjo, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 24, 1978, Ser. No. 936,395

Claims priority, application Japan, Nov. 29, 1977, 52-143687

Int. Cl.³ F02P *9/00*

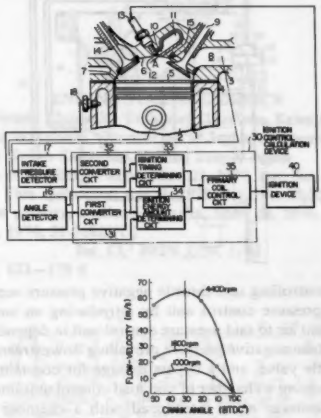
U.S. Cl. 123—416 **7 Claims**

1. In combination with an internal combustion engine having an output shaft rotated by the combustion of a fuel mixture, an ignition coil energized by an electric power source, and a spark plug, an ignition control system comprising:

means for detecting engine operating conditions including at least the rotational speed of said output shaft, said rotational speed being related to a flow velocity of the fuel mixture in a combustion chamber in the vicinity of a spark plug;

means for determining a timing of a spark ignition in response to said engine operating conditions detected by said conditions detecting means;

means for determining a period of energization of said ignition coil in response to said rotational speed of said output



shaft detected by said conditions detecting means, said speed being related to the flow velocity of the mixture, said period of energization being increased as said rotational speed of said output shaft decreases below and increases above a predetermined rotation speed such that the electric energy supplied from said electric power source to said ignition coil is changed to an optimum value relative to said mixture flow velocity; and

means for controlling the energization of said ignition coil in response to said timing of spark ignition determined by said timing determining means and said period of energization determined by said period determining means.

4,230,079

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Tokio Kohama; Tadashi Ozaki, both of Nishio; Hideki Obayashi, Aichi, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 2, 1979, Ser. No. 17,147

Claims priority, application Japan, Mar. 3, 1978, 53-24849

Int. Cl.³ F02M *25/06*

U.S. Cl. 23—568 **7 Claims**

1. An exhaust gas recirculation system for internal combustion engines comprising:

a recirculating passage for tapping exhaust gas from an exhaust pipe of said engine and feeding back into an intake pipe of said engine downstream of a throttle valve provided in said intake pipe;

a control valve for controlling the exhaust gas flow through said recirculating passage in response to a pressure signal;

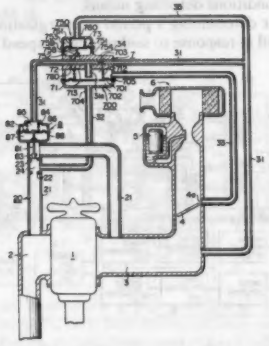
a pressure control valve means for controlling said pressure signal to be transmitted to said control valve;

a throttle port formed in said intake pipe at such position that said throttle port lies upstream of said throttle valve at the fully closed position thereof and lies at least partially

downstream of said throttle valve when said throttle valve is opened to a predetermined opening degree; and

a pressure cell provided in said recirculating passage between said exhaust gas pipe and said control valve;

said pressure control valve means including a pressure control unit for controlling said pressure signal in dependence on a throttle negative pressure produced at said throttle port and a pressure in said pressure cell, a load control unit



for controlling said throttle negative pressure supplied to said pressure control unit by introducing an amount of ambient air to said pressure control unit in dependence on an intake negative pressure prevailing downstream of said throttle valve, and a bypass passage for constantly communicating a chamber of said load control unit into which said ambient air is introduced with a chamber of said pressure control unit to which said throttle negative pressure is transmitted.

4,230,080

DEVICE FOR EXHAUST GAS RECYCLING

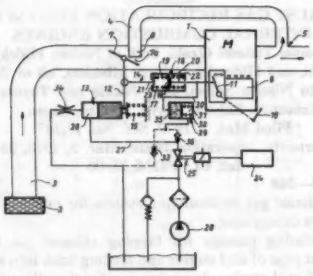
Gerhard Stumpp, Stuttgart, and Werner Banzhaf, Sindelfingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,267

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823671

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **9 Claims**



1. Device for exhaust gas recycling in internal combustion engines equipped with a fuel injection system, including an injection pump, and having a throttle valve to control the recycled stream of exhaust gas arranged in the intake manifold, further wherein the throttle valve for an exhaust gas return line terminates in said intake manifold and is directly connected with an adjusting lever of said injection pump.

4,230,081

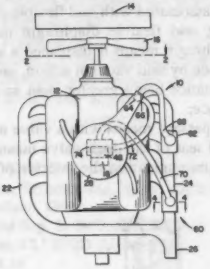
SYSTEM FOR IMPROVING INTERNAL COMBUSTION ENGINE FUEL EFFICIENCY

James S. Meek, 3303 Lockwood Dr., Chattanooga, Tenn. 37415

Filed Jun. 27, 1979, Ser. No. 52,671

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—555 **3 Claims**



1. In an internal combustion engine having a carburator with fuel inlet means and air inlet means for metering fuel and air to an intake manifold, a liquid fuel reservoir adjacent said inlet means for maintaining a small supply of fuel for entry into said fuel inlet means, an air cleaner assembly including a housing having an inlet and an outlet communicating with said carburator air inlet means, and an exhaust manifold, the improvement comprising a housing defining a plenum chamber positioned about and encapsulating at least a portion of said fuel reservoir, said housing including inlet means and outlet means for said plenum chamber, heat transfer means on said exhaust manifold for producing heated air, means communicating said heated air to the inlet means of said plenum chamber, and means communicating the outlet means of said plenum chamber with the inlet of said air cleaner assembly.

4,230,082

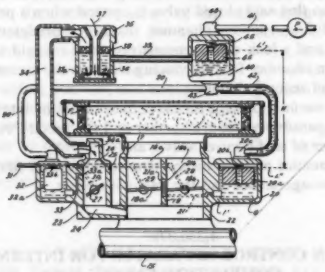
SYSTEM FOR REGULATING THE FUEL SUPPLY OF AN INTERNAL COMBUSTION ENGINE

Paul A. W. Jurschewitz, 43, rue du Poteau, Paris 18e, France

Continuation of Ser. No. 709,908, Jul. 29, 1976, abandoned. This application Apr. 23, 1979, Ser. No. 32,506

Int. Cl.³ F02M *37/14, 17/10, 19/08*

U.S. Cl. 123—518 **8 Claims**



1. In an internal-combustion engine for an automotive vehicle, provided with a carburetor fed from a fuel pump by way of interposed pressure-regulating means for supplying a fuel-/air mixture under the control of an accelerator to an alternately expanding and contracting combustion chamber, the improvement wherein said carburetor comprises:

a main duct provided with a constricted throat forming a

first air inlet and with a first outlet leading to said combustion chamber;

an ancillary duct of smaller cross-section than said main duct provided with a constricted throat forming a second air inlet and with a second outlet leading to said combustion chamber;

at least one first butterfly valve in said main duct linked with said accelerator for displacement between a wide-open position and a fully closed position;

a second butterfly valve in said ancillary duct ganged with said first butterfly valve for displacement by said accelerator between a wide-open position coinciding with the wide-open position of said first butterfly valve and a throttling position coinciding with said fully closed position;

a first injection nozzle opening into said main duct between said first inlet and said first butterfly valve and communicating with said pressure-regulating means for receiving fuel therefrom;

a second injection nozzle opening into said ancillary duct between said second inlet and said second butterfly valve and communicating with said pressure-regulating means for receiving fuel therefrom, said first and second injection nozzles communicating with said pressure-regulating means by way of respective connections supplying fuel thereto at a higher and a lower hydrostatic head, respectively;

a vessel containing a pool of fuel, said second air inlet communicating with the atmosphere through said vessel whereby air aspirated through said ancillary duct is precharged with fuel vapors; and

an air filter in said vessel overlying said pool, said vessel having an air entrance opening into said pool and an air exit above said filter whereby the aspirated air passes through said filter after traversing said pool.

4,230,083

FUEL SUPPLY APPARATUS

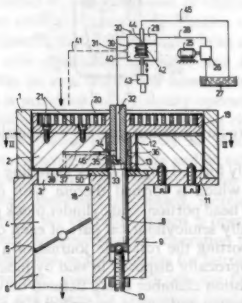
Wolf Wessel, Oberriexingen, and Konrad Eckert, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,705

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1978, 2805786

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—450 **6 Claims**



1. A fuel supply apparatus for mixture-compressing, externally ignited internal combustion engines having a housing, an air intake manifold with at least one fuel depositing point in said air intake manifold, an air flow rate meter and an arbitrarily actuatable throttle valve disposed in series in said air intake manifold and said air flow rate meter is moved against a restoring force in accordance with the quantity of air flowing therethrough, further wherein said housing includes an aperture which leads to said air intake manifold, said air flow rate meter being embodied as a relatively flat rotary member in the form of a circular sector that is arranged to variably open said aperture and swing laterally out of the cross-section of said air intake manifold in an opening motion, a shaft in said housing extending parallel to the direction of air flow in said air intake manifold and being disposed outside of the cross-section of said air intake manifold, said rotary member being fixed on said shaft for rotation transversely with respect to the flow of air in said air intake manifold and subjected on one side to the intake manifold pressure upstream and on the other side thereof to the intake manifold pressure downstream of said air flow rate meter.

4,230,084

ENGINE STARTING DEVICE

Isamu Gotoh, Kiyoseshi; Yoshinori Okamoto, Kawagoeshi, and Goroei Wakatsuki, Oimachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

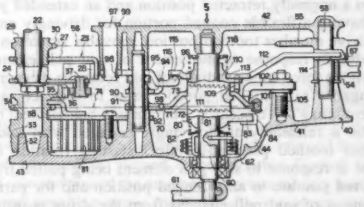
Division of Ser. No. 779,604, Mar. 21, 1977, Pat. No. 4,176,648.

This application Apr. 9, 1979, Ser. No. 28,522

Claims priority, application Japan, Mar. 24, 1976, 51-32096; Apr. 24, 1976, 51-51822[U]

Int. Cl.³ F02N *3/04, 5/02*

U.S. Cl. 123—179 S **5 Claims**



1. An engine starting device comprising:

an input member mechanically and operably connected to an engine;

a spiral spring;

an output member mechanically and operably connected to said spiral spring;

a driving member operably connected to and driven by said engine;

automatic force accumulating means operably connected to said spiral spring for accumulating force in said spiral spring;

said driving member being operably connected to said automatic force accumulating means for driving said automatic force accumulating means;

a winding pressure accumulating mechanism operably connected to said spiral spring;

a first one-way clutch means for selectively connecting said automatic force accumulating means with said winding pressure accumulating mechanism;

means for connecting said output member to said input member when the force accumulated by said spiral spring is released to start said engine;

a cam provided on an output shaft which is also an input member at the time of starting the engine;

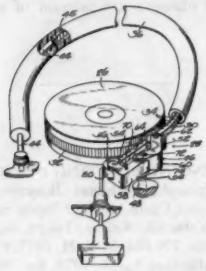
said automatic force accumulating operation means comprising an intermittently rotating member rocked by said cam; and

said intermittently rotating member and spiral spring winding pressure accumulating mechanism being connected with each other through a one-way clutch.

4,230,085
MANUAL STARTER FOR INTERNAL COMBUSTION ENGINES

Gene F. Baltz, Lake Villa, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 15, 1979, Ser. No. 3,702
Int. Cl.[3] F02N 3/02
U.S. Cl. 123—185 A 11 Claims

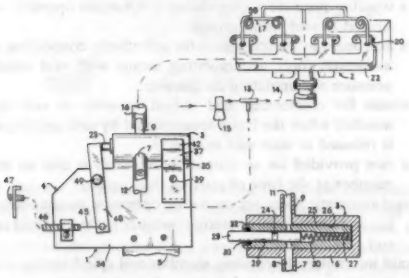


1. A manual starter for an internal combustion engine, said starter including a drive member mounted for rotation, operable to start the engine when rotated, and having a toothed portion, a flexible pull element mounted for movement between a normally retracted position and an extended position and having a flexible cogged portion for drivingly engaging said drive member toothed portion, movable actuation means operable in response to movement of said pull element for applying a force acting radially of said rotatable drive member and against said cogged portion so as to displace said pull element into a drive position wherein said pull element cogged portion is releasably and drivingly engaged with said drive member toothed portion to effect starting rotation of said engine in response to said pull element being pulled from the retracted position to an extended position and for permitting movement of said pull element from the drive position to a non-drive position wherein said pull element cogged portion is drivingly disengaged from said drive member toothed portion in response to said pull element being released or in response to the rotational speed of said drive member exceeding the pulled speed of said pull element, and retracting means for returning said pull element from an extended position to the retracted position.

4,230,086
FUEL DRIP PRIMING SYSTEM FOR COLD INTERNAL COMBUSTION ENGINES

John E. Lovret, 145-20 243rd St., Rosedale, N.Y. 11422

Filed Jan. 10, 1979, Ser. No. 2,376
Int. Cl.[3] F02M 1/16
U.S. Cl. 123—187.5 R 5 Claims

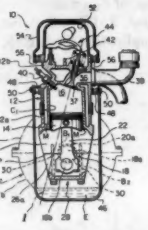


1. A system for drip priming a gasoline powered internal combustion engine of a motor vehicle for fast starting of the engine in cold weather, the engine being of a type having piston cylinder intake ports, a fuel pump and an intake manifold provided with outlet ends adjacent the piston cylinder intake ports, the system comprising: a selectively operable fuel feed control valve unit having an inlet and an outlet, the inlet being normally closed to the outlet; drip priming nozzles mounted in the intake manifold having outlet orifices in close proximity to the piston cylinder intake ports, the orifices opening out of the nozzles in opposed spaced relation to a bottom wall of the manifold; the inlet of the valve unit being connected to a discharge port of the fuel pump; a hose having an inlet end connected to the outlet of the valve unit and having multiple branch lines, each branch line being connected to a separate one of the nozzles; the hose and branch lines being adapted to fill with fuel as a consequence of operation of the fuel pump and operation of the valve unit to an open condition, and the nozzles being adapted to effect as a consequence thereof injection of the fuel into the manifold; and a loop formed in each branch line of the hose at a predetermined distance from the connection of the branch line with its related nozzle; and each nozzle being adapted upon the valve unit obtaining a closed condition to cease injection of fuel into the manifold and to thereafter effect dripping of fuel from the related branch line into the manifold to the extent of the fuel filling the related branch line between the related loop and the nozzle.

4,230,087
LOW-NOISE-LEVEL INTERNAL COMBUSTION ENGINE

Fumiyuki Abe; Yoshimasa Hayashi, both of Yokohama, and Akira Kimura, Kawasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 13, 1978, Ser. No. 959,474
Claims priority, application Japan, Nov. 17, 1977, 52/138296
Int. Cl.[3] F02F 1/00; F02B 77/00
U.S. Cl. 123—193 CH 11 Claims



1. A reciprocating piston internal combustion engine, comprising:

an integrally formed engine block including a cylinder block portion which is formed therein with cylinders, and a cylinder head portion, said cylinder block portion carrying a generally semicylindrical part of each of main bearings for supporting the rotatable journal of a crankshaft; pistons reciprocally disposed in said cylinders, respectively, a combustion chamber being defined between the crown of each piston and said cylinder head, the piston stroke of each piston being the same as or smaller than the bore diameter of each cylinder

a bearing support frame secured to said cylinder block portion of said engine block, and carrying the other generally semicylindrical part of each of the main bearings, the semicylindrical part carried by said bearing support constituting a generally cylindrical main bearing in cooperation with the semicylindrical part carried by said cylinder block portion; and

a sound-insulating cover elastically secured to said engine block in spaced relation to and around the engine block to

cover the outer surface of the cylinder block portion of said engine block.

4,230,088

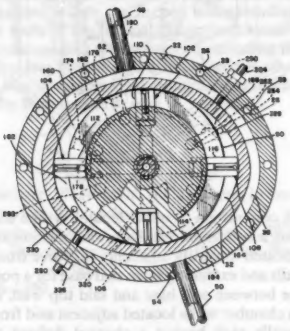
ROTARY INTERNAL COMBUSTION ENGINE WITH INTEGRATED SUPERCHARGING

Albert A. Southard, R.R. #3, Council Grove, Kans. 66846

Continuation-in-part of Ser. No. 745,555, Nov. 29, 1976, Pat. No. 4,134,382, which is a continuation-in-part of Ser. No. 522,500, Nov. 11, 1974, Pat. No. 3,994,641, which is a continuation-in-part of Ser. No. 322,430, Jan. 10, 1973, abandoned. This application Sep. 22, 1978, Ser. No. 944,850

Int. Cl.³ F02B 53/02, 53/08

U.S. Cl. 123—203 28 Claims



12. In a rotary internal combustion engine of the type wherein a rotor is mounted for rotation within a housing having a spaced inner surface surrounding the rotor, with a plurality of sealing means circumferentially spaced about and rotatable with the rotor to contact sealingly the inner surface of the housing to separate space between the rotor and the inner surface into a plurality of zones inclusive of adjacent first and second zones that orbit the axis during rotation of the rotor, and wherein the inner surface is noncircular in an arrangement such that each zone alternately increases and decreases in volume as it orbits an axis within the housing, and wherein operating means is provided for cyclically operating the first zone as an internal combustion engine working chamber on a four-phase cycle involving successively an intake phase, a compression phase, a combustion phase and an exhaust phase, said cycle having a duration such that the volume of such first zone is successively increased, decreased, increased and decreased, and wherein the operating means is operatively connected to the rotor for synchronized operation thereof with rotation of the latter and includes means for introducing air to such working chamber, means for introducing fuel into such working chamber and means for exhausting combustion products from such working chamber; the improvement comprising in combination therewith the provision of air pumping means for cyclically operating the second zone as an air pumping chamber with the duration of a pumping cycle being such that the volume of said second zone is successively once increased and once decreased, said air pumping means being operatively connected to the rotor for synchronized operation thereof with rotation of the latter and includes normally closed valve means that opens between ambient atmosphere and the pumping chamber as the volume of the latter increases, and means for feeding air to the engine working chamber.

4,230,089

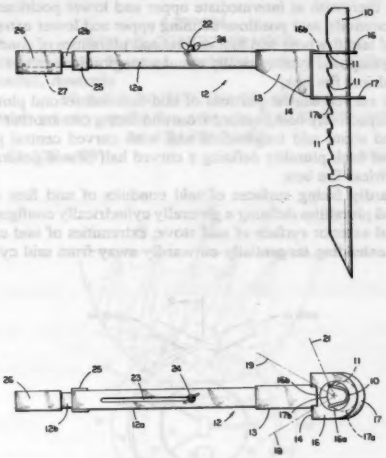
SUPPORT ASSEMBLY FOR COOKING UTENSILS

Allan D. Barden, R.R. 32, Box 467, Terre Haute, Ind. 47803

Filed Oct. 2, 1978, Ser. No. 947,414

Int. Cl.³ F24B 3/00

U.S. Cl. 126—30 7 Claims



1. A support assembly for utensils utilized in cooking food over a source of heat such as a campfire or the like, said assembly including a vertical elongated member generally U-shaped in cross-section having a central longitudinal axis and having a series of horizontally aligned detent notches formed in the vertical side margins of the member, a horizontal arm having at its free end attaching means for detachably securing a cooking utensil to the arm, said arm at its other end being adjustably joined to said vertical member by two vertically spaced horizontal plates attached to said arm and each of said plates having a circular aperture therethrough sized to closely accomodate said vertical member, the corresponding aperture margins nearest said arm being horizontally spaced a distance substantially equal to the depth of the detent notches on said vertical member, whereby tilting the arm to align the centers of said apertures with the central longitudinal axis of said vertical member permits said vertical member to extend through said apertures and said spaced plates with attached arm to slide along said vertical member and to seat in selected ones of said notches when said arm is positioned substantially normal to said vertical member and alternate ones of said vertically spaced horizontal plates enter said notches as said arm is pivoted through 180° in a horizontal plane about said vertical members.

4,230,090

HEATING STOVE

Eric Darnell, South Strafford, Vt. 05070

Filed May 1, 1978, Ser. No. 901,582

Int. Cl.³ F24B 7/00

U.S. Cl. 126—72 11 Claims

1. A heating stove comprising:

(a) a longitudinally extending generally cylindrical fire box including:

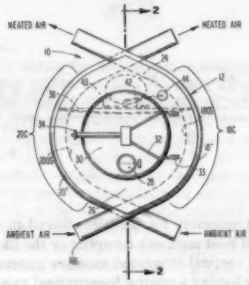
(i) a first plurality of parallel aligned connected vertically oriented curved uniform cross-section open-ended conduits, lower extremities of said conduits of said first plurality aligned for contacting a planar surface to thereby support said stove;

(ii) a second plurality of parallel aligned connected vertically oriented curved uniform cross-section open-ended conduits, lower extremities of said conduits of said second plurality aligned for contacting said planar surface to thereby support said stove;

said second plurality of conduits positioned opposing said first plurality of conduits and in alternating interdigitated engagement therewith at intermediate upper and lower positions on said conduits, said positions defining upper and lower extremities of said fire box; said first and second pluralities of conduits being disposed symmetrically about a longitudinal axis of said cylindrical fire box;

major curved central portions of said first and second pluralities respectively being spaced from and facing one another and curved about said longitudinal axis with curved central portions of each plurality defining a curved half of said generally cylindrical fire box;

outwardly facing surfaces of said conduits of said first and second pluralities defining a generally cylindrically configured curved exterior surface of said stove; extremities of said conduits extending tangentially outwardly away from said cylin-



drically configured fire box and defining upper and lower stove extremities; upper extremities of said conduits of said first and second pluralities being vertically aligned with their respective lower extremities;

(iii) a generally planar back plate having an exhaust port therethrough;

(iv) a generally planar front plate, of substantially the same size and shape as said back plate, including an operable door having an inlet port therethrough;

most forward positioned conduits of said first and second pluralities each connected to said front plate at the periphery thereof; most rearward positioned conduits of said first and second pluralities each connected to said back plate at the periphery thereof;

(b) a longitudinally extending generally planar baffle connected to at least some of said conduits of said first and second pluralities, and to said back plate below said exhaust port to contact said back plate across the interior width thereof, extending forward towards said front plate, within said fire box interior;

(c) valve means, in said door, for admitting air to said fire box.

4,230,091

STOVE

Kenneth E. Judge, London, and Jerald D. Hayter, Ilderton, both of Canada, assignors to Carmor Manufacturing Ltd., London, Canada

Filed Aug. 23, 1978, Ser. No. 936,067
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—77 **12 Claims**

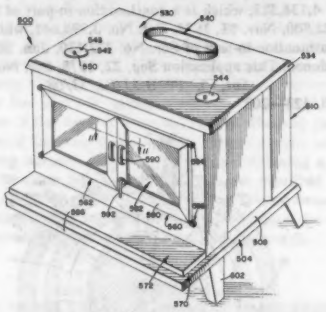
1. A stove comprising:

a base;

a stove front, rear and side walls on said base and extending away therefrom, said rear and side walls each including a central portion, an end portion on each end of said central portion, and offset portions connecting said central and end portions together, said end portions being essentially coplanar with each other and in a plane which is in spaced parallelism with a plane containing said central portion;

a stove top wall on said walls and spaced from said base;

at least one anti-warping bar on each of said front and rear stove walls, said anti-warping bars each extending upward from adjacent said base for essentially the entire length of said front and rear stove walls, said anti-warping bars and said wall portions providing structural support for a stove while increasing the heat output of that stove;



a firebrick combustion chamber located within the stove and including a bottom on said base, and combustion chamber walls located inwardly adjacent said stove front, rear and side walls and extending from said base for a portion of the distance between said base and said top wall, those combustion chamber walls located adjacent said front and rear stove walls each having a channel defined therein for accommodating said anti-warping bars;

holder support means located adjacent the intersection of said combustion chamber walls for positioning said combustion chamber walls and for reinforcing said combustion chamber wall intersections; and

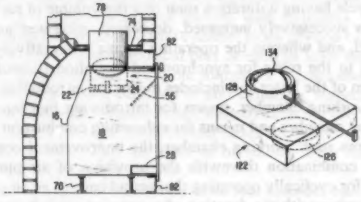
channel-shaped top caps resting on top edges of said combustion chamber walls.

4,230,092

METHOD AND APPARATUS FOR IMPROVEMENTS IN CONVECTIVE HEATING

Joseph Henriques, 24 Hidden Brook Dr., Brookfield, Conn. 06804

Filed Apr. 17, 1978, Ser. No. 897,009
Int. Cl.³ F24C *15/30*
U.S. Cl. 126—126 **29 Claims**



1. An improved convective heating system of the type having fireplace enclosure walls, a chimney with an apertured fireplace pan (**74**) for receipt of nascent products of combustion, and an elongate firebox (**10**) having bottom (**12**), top (**14**), back (**16**) and side walls (**18**) positioned in spaced relation to the corresponding fireplace enclosure walls and defining therewith a convective flow path of air across said firebox walls,

said firebox having a front wall with a fuel receiving opening and a hearth area rearwardly of said front wall, the walls of the firebox defining an elongate volume of space within the firebox, the improvement comprising:

(A) means, connected to the firebox, for maintaining an ignition temperature range substantially throughout that elongate volume of said firebox overlying said hearth area, said means including a flue assembly (20) having a flue extension (24) passing downwardly through the top wall of the firebox into the firebox with an opening (22) for receipt of nascent combustion products, the flue extension extending below the top wall of the firebox so as to create a blanket of hot combustion products (44) adjacent the firebox top wall, the flue assembly having a flue pipe (78) connected at one end to the outlet end of the flue extension and at its other end to the apertured fireplace pan (74) of the chimney for allowing the combustion products to pass up the chimney while preventing the convective flow path of air from passing up the chimney; and

(B) combustion air inlet means including a preheat manifold (28) mounted within the firebox and extending between the side walls of the firebox, the preheat manifold having at least one opening (50) at one end extending through the corresponding firebox side wall for receipt of combustion air and also having means for distributing this combustion air to the firebox hearth area.

4,230,093

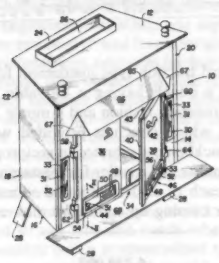
FIREPLACE DOOR

Carrol E. Buckner, Weaverville, N.C., assignor to Smoky Mountain Enterprises, Inc., Asheville, N.C.

Continuation-in-part of Ser. No. 693,805, Jun. 7, 1976, Pat. No. 4,092,976. This application Aug. 26, 1977, Ser. No. 828,207

Int. Cl.³ F23M *7/00*

U.S. Cl. 126—190 **1 Claim**



1. A heating unit comprising:

a firebox;

an access opening in the front wall of said firebox;

a pair of doors pivotally mounted to said front wall for covering said access opening;

a first of said doors having a first handle thereon;

a second of said doors having a second handle on the exterior surface of said second door and a latch means on the interior surface of said second door;

said latch means including a plate extending beyond the periphery of said second door and of a length sufficient to extend behind an interior portion of said front wall of said firebox, a pair of posts extending from said interior surface of said second door and positioned on opposite sides of said plate to limit movement of said plate between a first vertical position and a second horizontal position, said plate being connected to said second handle for rotation between said pair of posts;

each of said doors comprising a main planar portion with a space between said main planar portions when said doors are in a closed position; and

a planar vertical strip extending from the exterior surface of said second door and adapted to overlap the exterior surface of said first door main planar portion to retain said first door in closed position when said second door is in closed position whereby movement of said latch means to latched position will retain both of said doors in closed position.

4,230,094

SOLAR CONCENTRATOR

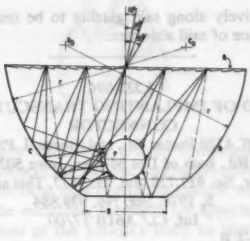
Wally Szulmayer, Burwood, Australia, assignor to Unisearch Limited, Australia

Filed Feb. 10, 1976, Ser. No. 656,945

Claims priority, application Australia, Feb. 13, 1975, PC0596

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **5 Claims**



1. A solar radiation concentrator comprising:

trough means, having an open portion, for reflecting solar radiation incident thereupon;

refracting means, covering said open portion of said trough means, for refracting solar radiation incident thereupon onto said trough means, said refracting means comprising at least one strip of transparent material including a pattern of prismatic parallel grooves; and

target means, linearly, extended in said trough means parallel with a longitudinal axis of said strip means, for absorbing solar radiation refracted and reflected thereupon by said refracting means and said trough means, respectively, said trough means including at least two side portions, each of said side portions is a circular curved reflective portion with a center of curvature offset from a center of curvature of the other side portion, and a substantially flat bottom portion, said side portions in combination with said refracting means facilitating the focussing of solar radiation, incident at angles up to 30° from a normal to said refracting means, upon said target means so as to permit stationary operation of said concentrator without sun-tracking or seasonal orientation.

4,230,095

IDEAL LIGHT CONCENTRATORS WITH REFLECTOR GAPS

Roland Winston, Chicago, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

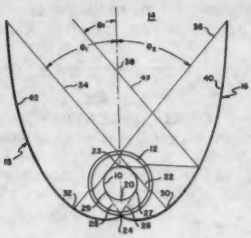
Filed May 26, 1978, Ser. No. 909,864

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **5 Claims**

1. A cylindrical radiant energy concentration and collection device, comprising: an energy absorber having an exterior surface, a glazing enveloping and spaced from said absorber, and a first reflective wall, said absorber, said glazing and said first wall being aligned parallel to an axis to form a trough-shaped structure, said wall having an ideal contour determined with respect to a virtual absorber shape, said virtual absorber shape having a cross sectional area in a plane perpendicular to said axis defined by the cross sectional area of said absorber in

said plane and the additional area defined by the intersection of a first and a second tangent line drawn from a first and a second point respectively along said glazing to be tangent with the exterior surface of said absorber.



4,230,096

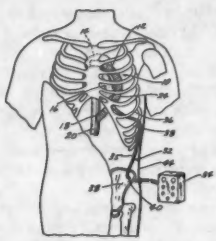
METHOD OF IMPLANTING TRANSCUTANEOUS CONNECTOR

Robert H. Zeff, 4220 Foster Dr., and Steven J. Phillips, 6023 N. Waterbury Rd., both of Des Moines, Iowa 50312

Division of Ser. No. 817,728, Jul. 21, 1977. This application Sep. 5, 1978, Ser. No. 939,884

Int. Cl.[3] A61B *17/00*

U.S. Cl. 128—1 R 7 Claims



1. A method of implanting a transcutaneous tube connector, comprising the steps of

forming a tube connector aperture in a bone located closely adjacent the body outer skin, and

routing the tube connector from the body cavity where it is connected to a body organ through said aperture and outwardly through the skin for transmission of fluid between the body cavity and the outside.

4,230,097

BREATHING AND ACCELERATION PROTECTION APPARATUS FOR AIRCRAFT CREW MEMBERS

Raymond Beaussant, Bretigny Sur Orge, and Jacques Claude, Fresnes, both of France, assignors to Intertechnique, Plaisir, France

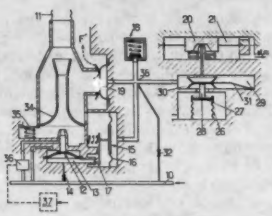
Filed Jun. 30, 1978, Ser. No. 921,090

Claims priority, application France, Jul. 1, 1977, 77 20345

Int. Cl.[3] A61B *19/00*

U.S. Cl. 128—1 A 14 Claims

1. A breathing and acceleration protection apparatus for the crew of fighter aircraft, having a source of pressurized gas, anti-g regulator valve means having an input connected to said source and an output constructed to be connected to inflatable trouser pockets of a g-suit carried by a member of said crew, and a demand regulator arranged to deliver respiratory gas to said crew member, wherein said anti-g regulator valve means include an inertia body movable along a predetermined direction responsive to acceleration along said direction, valve means controlled by said inertia body and controlling the pressure in said pockets as an increasing function of the acceleration, and additional means responsive to the aircraft altitude for setting a pressure in said pockets at a value which increases with altitude in the absence of acceleration.



4,230,098

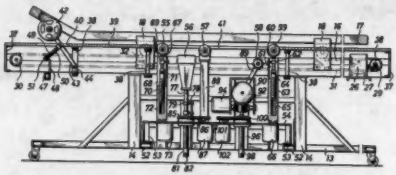
RHYTHMICAL TRACTION TYPE DEVICE FOR MEDICAL TREATMENT

Kazuma Uematsu, 1-17-3 Oyamadai, Setagaya-ku, Tokyo, Japan

Filed Feb. 13, 1979, Ser. No. 11,934

Int. Cl.[3] A61H *1/00*

U.S. Cl. 128—33 10 Claims



1. A rhythmical traction type instrument for medical treatment including a couch having a movable frame mounted thereon in reciprocating fashion and a motor for moving said movable frame, which couch is provided with a roller for correcting the backbone, a vibrator, a reciprocating roller for massaging the lumbar and a roller for massaging the lower half of one's body, each of said rollers and vibrator being fitted with a motor for causing up and down movement thereof.

4,230,099

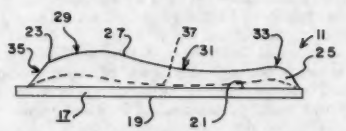
DEVICE FOR ALINING THE SPINE

Billy H. Richardson, 9140 Millbranch, Southaven, Miss. 38671

Filed Feb. 21, 1979, Ser. No. 13,629

Int. Cl.[3] A61F *5/00*

U.S. Cl. 128—69 11 Claims



1. A device for use in alining a human spine, said device comprising: first and second elongated ridge members and a bridge means for holding said first and second elongated ridge members substantially parallel to and alined with one another

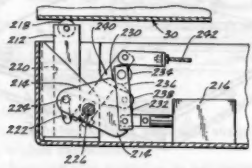
at a substantially constant distance apart from one another, each of said ridge members having a first end and a second end and an upper surface, said upper surface of each of said ridge members being continuous and gently curved and forming a convex curve substantially at said first end thereof, forming a concave curve intermediate said first and second ends thereof and forming a substantially flat, sloping area adjacent said first end thereof.

4,230,100

CHIROPRACTIC TABLE

Derryl E. Moon, Fairmount, N. Dak. 58030

Filed Jul. 26, 1978, Ser. No. 927,961
Int. Cl.³ A61F 5/00
U.S. Cl. 128—70 **3 Claims**



1. A chiropractic table comprising:
an elongated table frame,
a plurality of support pieces positioned in spaced relation along the length of said table and each having an upwardly presented support surface,
mounting means for mounting at least one of said support pieces to said frame for vertical movement between upper and lower positions;
a vertically movable member mounted to said table frame for vertical movement with respect thereto, and being in supporting engagement with said one support piece;
a rotatable cam mounted to said frame for pivotal movement about a horizontal axis, said cam having first and second ends on opposite sides of said axis, said first end engaging said vertically movable member for lifting thereof in response to rotational movement of said cam in one direction and for lowering thereof in response to rotation of said cam in the opposite direction;
said second end of said cam having a cam surface comprising a curved surface and a notch,
a cam follower in rolling engagement with said cam surface and adapted to roll into said notch when said vertically movable member is in a predetermined upper position;
yieldable power means connected to said cam follower for urging said cam follower toward said notch with a force of predetermined magnitude and being yieldable to permit said cam follower to roll out of said notch in response to a moment of predetermined magnitude exerted on said cam by a downward force acting through said support piece and vertically movable member.

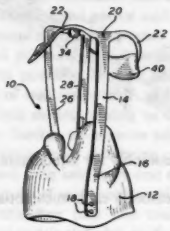
4,230,101

BACK BRACE

Jack Gold, 4 Hillary Ct., Livingston, N.J. 07039

Filed Aug. 28, 1978, Ser. No. 937,611
Int. Cl.³ A61F 5/02
U.S. Cl. 128—78 **1 Claim**

1. In a back brace for the treatment of scoliosis in a patient, said brace comprising, a rigid, molded plastic pelvic girdle shaped to fit closely about the lower stomach and pelvic portion of a patient, said girdle adapted to substantially surround the patient and coming together in a separable posterior joint, a pair of posterior rigid metal uprights, one of said uprights positioned on each side of said posterior joint, a single anterior rigid metal upright fastened substantially centrally of said girdle and extending vertically upward and adapted to fit the curvature of the front of the patient, each of said uprights terminating at a level just below the level of a patient's clavicle, laterally extending rigid metal arms fastened to the upper portions of said uprights and curved so as to be adapted to encircle the body of the patient at the approximate level of the patient's armpits, underneath the patient's arms, means on said girdle to secure the joint portions of the girdle together and means on the upper portions of said pair of posterior uprights



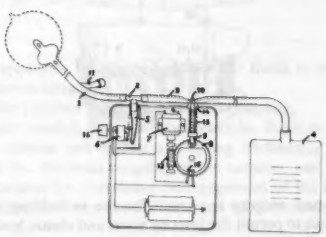
to secure them to each other thereby forming a closed brace adapted to surround the patient, and means associated with a selected portion of at least one of the upright members and at least one of the encircling members for applying pressure to selected portions of the patient's body so that an abnormal curve of the patient's spinal column may be either reduced or eliminated by lateral pressure applied to the patient's body through said metal uprights.

4,230,102

DEVICE FOR THE TRAINING OF A URINE BLADDER

Fred V. G. Ekbladh, Kungsbacka, Sweden, assignor to Astra-Sjuco AB, Goteborg, Sweden

Filed Apr. 17, 1978, Ser. No. 896,746
Claims priority, application Sweden, Apr. 25, 1977, 7704703
Int. Cl.³ A61F 5/00; A61M 25/00
U.S. Cl. 128—79 **12 Claims**



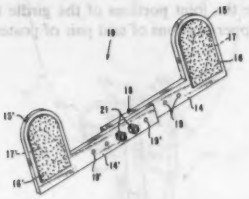
1. A device for exercising a urine bladder into which a catheter has been inserted, comprising closing-opening means engaging said catheter, said closing-opening means being normally closed for preventing flow through said catheter, means for detecting the pressure in said catheter between said bladder and said closing-opening means, and actuation means coupled to the pressure detecting means for opening said closing-opening means for a pre-set time period to permit flow through said catheter in response to the detection of a predetermined pressure by said pressure detecting means, said pre-set time period being sufficient to permit said bladder to empty at least substantially, wherein said actuation means is adjustable for opening said closing-opening means at one of a plurality of predetermined pressures in said catheter.

4,230,103

ORTHOPEDIC DEVICE

Renald A. Cote, 1021 26th St., NW., Washington, D.C. 20037

Filed Nov. 30, 1978, Ser. No. 966,192
Int. Cl.[3] A61F *3/00*
U.S. Cl. 128—80 A 7 Claims



1. An orthopedic assembly for attachment to a child's shoes comprising:

a pair of plate members, each substantially larger than a child's shoe;

a pair of children's shoes adapted to be operatively attached to said plate members;

means for operatively attaching said plate members together so that they are disposed in a common plane and so that they cannot rotate with respect to each other or said attaching means; and

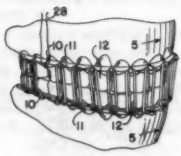
means for operatively attaching said pair of plate members to said pair of child's shoes so that the angular position the shoes may assume relative to the plate members is continuously adjustable, and so that the shoes are readily removable from the plate members, said means comprising cooperating hook and loop fastening means attached to coplanar faces of said plate members, and to the bottoms of said shoes.

4,230,104

SPLINTS FOR TREATING JAW FRACTURES

Alice E. Richter, 260 N. Cache St., Jackson, Wyo. 83001

Filed Jan. 23, 1978, Ser. No. 871,642
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 A 2 Claims



1. An oral surgery appliance for use in holding together human jaws to permit the jaws by wires and elastic bands to set properly, the improvements comprising:

a malleable arch bar member;

said arch bar member having metal means adapted to be shaped into a curved configuration about a person's teeth and conform to the contour thereof;

said arch bar having flat back for positioning adjacent the wearer's teeth and also having an arcuate front extending downwardly from the top of the flat back;

prong means;

said prong having base means extending horizontally from said bar member;

tab means including a first portion extending from said base member;

said tab means including means movable by bending from a first position spaced from the arch bar member to a second position with a portion of said tab adjacent to the arch bar member yet shorter than the contiguous portion of the arch bar member to provide a smooth contour; and

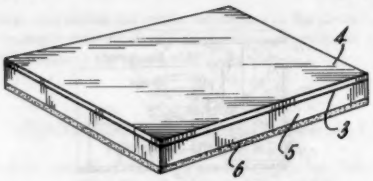
said means movable by bending comprising means adapted to extend away from said arch bar member and confine and hold said elastic bands.

4,230,105

TRANSDERMAL DELIVERY OF DRUGS

Richard J. Harwood, Philadelphia, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 13, 1978, Ser. No. 960,354
Int. Cl.[3] A61L *15/00*
U.S. Cl. 128—156 2 Claims



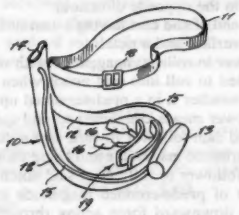
1. An improved medical bandage for the administration of drug through the skin or mucosa which comprises a layered bandage comprising first a heat-generating layer containing a hydrate-forming inorganic salt dispersed throughout an inactive matrix layer, and second, a pressure-sensitive adhesive area containing drug to be administered to the patient, dispersed intimately throughout said adhesive layer.

4,230,106

ARTICULATED SNORKEL

John W. Geeslin, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed May 12, 1978, Ser. No. 905,334
Int. Cl.[2] B63C *11/16*
U.S. Cl. 128—201.11 3 Claims



1. An articulated snorkel, comprising in combination a support for being worn around a person's head, a pair of air supply tubes adapted to extend around opposite sides of said person's head, each tube terminating at the rear end thereof in a common tubular opening including a normally deflated tube bladder, a mouthpiece at a forward end of each of said air supply tubes connected to and in communication with said mouthpiece, said mouthpiece adapted to be positioned in the mouth of said person for communication therewith, with said air supply tubes extend around the person's head and said common tubular opening in the rear of the person's head, a bit integral with said mouthpiece for placement between front teeth, a pair of normally inflated mouth bladders mounted to and extending from said bit for being squeezed between side teeth of said person, a pair of connecting tubes connecting said tube bladder with said mouth bladders whereby upon squeez-

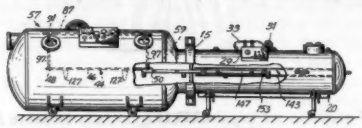
ing said mouth bladders causes inflation of the normally deflated tube bladder, means to retain said mouth bladders aligned between said side teeth and flapper purge valves mounted at each end of said mouth piece.

4,230,107

RAIL SYSTEM AND GAS METERING SYSTEM IN A HYPERBARIC SYSTEM

Glenn J. Butler, White Plains, N.Y., assignor to IUC International, Inc., Bronx, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,808
Int. Cl.³ A61M *16/02*
U.S. Cl. 128—205.26 **16 Claims**



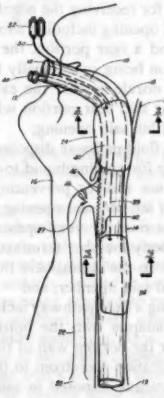
1. A hyperbaric system comprising
a hyperbaric chamber having an inside surface;
a stretcher within said chamber;
a means for hanging said stretcher in a substantially horizontal plane in said chamber, said means comprising a supporting structure transversely mounted on said inside surface substantially above said stretcher and hanging means attached to said stretcher and connected with said supporting structure and extending downwardly from said supporting structure to permit slidable movement of said hanging means and therefore of said stretcher along said supporting structure whereby said hanging means does not obstruct the sides and undersides of said stretcher.

4,230,108

APPARATUS AND METHOD FOR SEALING ESOPHAGEAL ENTRANCE TO TRACHEA ABOVE AND BELOW

Sharon L. Young, 8600 Pontchartrain Blvd. Apt. 312, New Orleans, La. 70124

Filed Mar. 13, 1979, Ser. No. 20,146
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—207.15 **2 Claims**



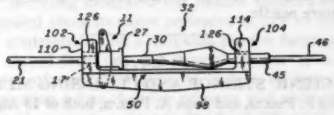
1. Apparatus for sealing trachea entrance from above and below entrance to esophagus comprising:
(a) flexible esophageal tube means, having oppositely disposed ends, for insertion of one end into the esophagus past the entrance of said trachea to a position in the esophagus opposite tracheal carina, with the other end remaining outside of the mouth, said esophagus tube means being flattened on a anterior side thereof between said trachea entrance and carina for sealing said esophageal tube means on an area greater than a tangential strip;
(b) upper inflatable cuff means fixed to said esophageal tube means above said tracheal entrance for sealing said tracheal entrance from above;
(c) lower inflatable and deflatable cuff means fixed between said trachea entrance and above said tracheal carina said lower cuff means extending around the round posterior sides only and providing no expansion on the flattened anterior side to possibly occlude said trachea in case of over inflation of said lower cuff; and
(d) ventilation tube means, having an open end and closed end, interiorly fixed to an anterior side of said esophageal tube means, said anterior side being common to both said tube means, and with said open end extending outwardly beyond the mouth of said esophageal tube means, and the closed end extending past said tracheal entrance, said common anterior side defining perforations opposite said entrance for ventilating the lungs therethrough.

4,230,109

APPARATUS FOR SECURING COUPLINGS OF INTRAVENOUS AND INTRA-ARTERIAL ACCESS SYSTEMS

Alan Geiss, 50 Brampton La., Great Neck, N.Y. 11030

Filed Aug. 21, 1978, Ser. No. 935,669
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R **10 Claims**

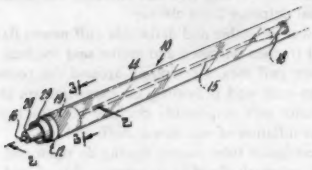


1. An apparatus for conveying vascular fluids to or from a patient, comprising:
a tubular catheter having a frictional coupling;
a tubular conduit for conveying vascular fluids to or from the catheter and having a coupling frictionally engaged with the frictional coupling of the catheter; and
an apparatus for restraining disengagement of the frictional coupling between the catheter and tubular conduit, comprising:
a base member;
a clamp means affixed to one of the tubular catheter and conduit, comprising first and second members projecting from the base member and having opposed, diverging surfaces wedging said one of the tubular catheter and conduit radially therebetween;
retaining means on the diverging surfaces of the clamp means for opposing disengagement of said one of the catheter and conduit from wedged relation between the surfaces of the first and second members;
whereby tubular catheters and conduits of various radial dimensions may be retained by the clamp means; and
an affixing means spaced axially from the clamp means on the base member and affixed to the other one of the tubular catheter and conduit.

4,230,110
HUB WITH SUTURING PROVISION FOR MEDICAL DEVICES

Howard Beroff, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 22, 1978, Ser. No. 935,840
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—214.4 1 Claim



1. A hub suitable for use with an introducer catheter and adapted to remain in a fixed position on a patient comprising:

a body with a passage therethrough adapted to receive a catheter for insertion into a patient and having a diameter greater than the outer wall of said catheter to facilitate the easy insertion of said catheter therethrough without substantial frictional resistance;

a first thin walled flange extending from said body, coaxially aligned about said passageway and defining an extension thereof coterminous therewith;

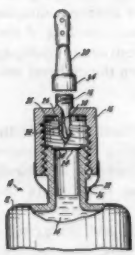
an annular dimple on the end of said first flange and projecting into said passage extension and engaging the outer periphery of said catheter and providing a resilient seal thereagainst but permitting said catheter to slide therethrough into said passageway;

a second thin walled flange extending from said body and coaxially aligned with the axis of said passageway and having an interior wall spaced radially apart from said first thin walled flange, said second thin walled flange including a pierceable section adapted to be pierced for suturing said hub to said patient and thereby anchoring the same in place regardless of the angular orientation of said hub with respect to the patient, said radial space between said first and said second flanges permitting the passage of a suture needle.

4,230,111
HYGIENIC SYRINGE AND CLEANSING METHOD

Nicholas F. Piazza, and Joan A. Piazza, both of 13 Alpine Way, Huntington Station, N.Y. 11746

Filed Apr. 13, 1979, Ser. No. 29,728
Int. Cl.[3] A61M 3/00
U.S. Cl. 128—225 11 Claims

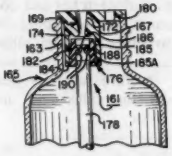


1. A hygienic syringe for dispensing a hygienic liquid mixture in an effervescing state comprising a container having a neck portion extending therefrom, a hygienic liquid mixture within said container having a gas dissolved therein when said hygienic liquid mixture is stored within said container in a pre-charged condition, said hygienic liquid mixture reaching an effervescing state when said dissolved gas is released therefrom by sufficient disturbance of said precharged condition of said hygienic liquid mixture within said container, a cap constructed and arranged to movably engage said neck portion and having a cap opening therein to communicate the hygienic liquid mixture in said container to a dispensing location, and sealing means on said neck portion and responsive to movement of said cap for preventing said hygienic liquid mixture in said pre-charged condition from entering said cap opening when said cap is in a first position and for enabling said hygienic liquid mixture when in said effervescing state to be propelled out of said container through said cap opening in response to pressure developed within said container by said released gases when said cap is in a second position.

4,230,112
SYRINGE-TYPE LIQUID CONTAINER DISPENSER ADAPTER

Philip E. Smith, 6033 N. Sheridan Rd., Chicago, Ill. 60660

Filed Aug. 7, 1978, Ser. No. 931,712
Int. Cl.[3] A61J 1/00; B65D 39/00; B65B 1/04
U.S. Cl. 128—272.3 11 Claims



1. An adapter for connecting in fluid communication a nozzle of a liquid medication dispensing syringe-type dispenser with the interior of a bottle having a bottom wall and containing liquid medication or the like comprising:

a tubular body member composed of resilient material and being generally cylindrical in shape to fit snugly within the mouth of the bottle;

means defining an opening extending axially through said body member for receiving the nozzle of the syringe-type dispenser, said opening including a forward nozzle receiving portion and a rear portion, the axial length of said forward portion being substantially the same as the axial length of the nozzle so that the exit end of the nozzle terminates near said rear portion when the nozzle is inserted fully within said opening;

means defining a fluid pathway disposed at said rear portion of said opening for guiding liquid to said forward nozzle-receiving portion and for preventing or minimizing the introduction of air into said opening;

means defining a re-entry vent opening extending axially through said body member terminating near the bottom thereof to vent to the atmosphere the space between the liquid level and said member; and

said means defining a fluid pathway including a tube depending from the adapter into the bottle terminating at its lower end near the bottom wall of the bottle for conveying liquid medication therefrom to the nozzle of the dispenser; valve means disposed in said fluid pathway for permitting liquid medication to flow from said tube to the nozzle when it is inserted in the nozzle-receiving opening and for trapping liquid medication in said tube near the first-mentioned opening when the dispenser is withdrawn from said opening.

4,230,113

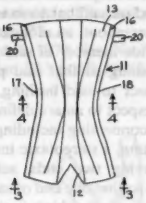
INFANT'S DIAPER

Khusal Mehta, T2-6 Hatfield Village Apts., Hatfield, Pa. 19440

Filed Jul. 17, 1978, Ser. No. 924,917

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **1 Claim**



1. A moisture absorbing infant's diaper for newborn babies, comprising an outer water impervious layer, an intermediate moisture absorbing layer and an inner moisture transmitting layer, the two long sides being folded inwardly about midway of their lengths to form a central pleat which reduces the central width of the diaper, which is about 22 cm. wide, about 27 cm. long and has in one of its narrow ends a V-shaped notch which opens out at that edge of the diaper, said notch being centrally located along that end and being from 2.5 to 4.5 cm. deep and from 4 to 6 cm. wide at the edge.

4,230,114

EXERCISE PANTS

Jack V. Feather, P.O. Box 737, Pebble Beach, Calif. 93953

Filed Mar. 2, 1978, Ser. No. 882,649

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—293 **6 Claims**

1. A pair of exercise pants comprising a pant material which throughout its length and width is non-porous and non-absorbent,

means for cinching said pant material about the waist and legs of the user whereby the space between the pant material and the user's body is substantially pneumatically isolated from outside atmosphere, and

connector means sealedly secured to said pant material, said connector means being adapted to permit an air evacuation hose to be attached thereto whereby when the user exercises, such as by running in place, air can be evacuated from the interior of said pants causing the pant material to press against the user's body to induce sweating and to thereby promote overall girth reduction, wherein said connector means includes an air permeable bolster means disposed on the internal side of said pants for holding said connector means together with the pant material immediately surrounding same away from the user's body surfaces whereby the connector means and surrounding pant material are prevented from bearing down onto the user's skin while air is being evacuated from the interior of said pants.

4,230,115

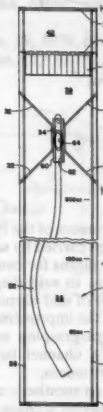
CATHETERIZATION UNIT

Arthur J. Walz, Jr., Elk Grove Village, and Christopher A. Nowacki, Des Plaines, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 831,702, Sep. 12, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,336

Int. Cl.³ A61F *5/44*

U.S. Cl. 128—295 **33 Claims**

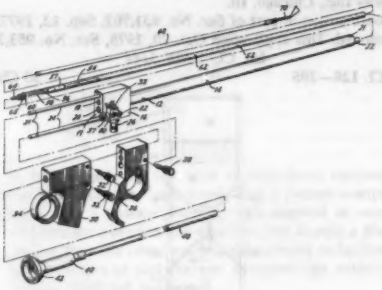


1. An aseptic urethral catheterization unit including an elongated initially sealed flexible imperforate container, a urethral catheter having a predetermined diameter throughout a substantial portion of its length positioned in said container, said container including elongated flat flexible imperforate sheet material sealed about its entire perimeter in face to face relation, said container having a restricted portion forming a passageway spaced from one end thereof formed by sealing a limited area of said sheet material in face to face relation thereby creating a first chamber between said restricted portion and said one end, a second chamber substantially larger than said first chamber being formed between said restricted portion and said opposite end, substantially all of said catheter being initially positioned within said second chamber in an aseptic fashion but adapted for movement through said passageway upon manipulation externally of said container, said catheter having an eye adjacent one end communicating with the axial bore of said catheter, means for initially maintaining said eye end of said catheter substantially within said passageway which communicates between said chambers, and a transversely disposed weakened portion positioned between said one end and said restricted portion, said weakened portion having a generally linear configuration and existing in substantially aligned relation in each independent layer of said sheet material, said aligned portion extending substantially across the entire width of said container between opposite edges on a line spaced from said one end and said portion being manually separable along said line to break said seal upon manipulation and expose said eye end of said catheter and said first chamber in the interior of said container, said second chamber adapted for collection and acceptance of an aseptic specimen and aseptic initial storage of said catheter, whereby application of a surgical lubricant into said first chamber adjacent said restricted portion passageway substantially seals the juncture of said catheter and said passageway and protects said second chamber against external contamination.

4,230,116
TUBAL LIGATION INSTRUMENT WITH ANESTHESIA MEANS

Trevor F. Watson, Columbia, Mo., assignor to Kli, Inc., Newtown, Pa.

Filed Oct. 2, 1978, Ser. No. 947,467
Int. Cl.[3] A61B 17/12
U.S. Cl. 128—303 A 17 Claims

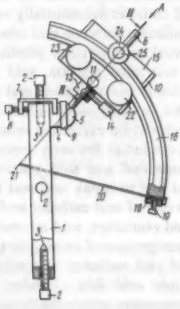


1. In a tubal ligation instrument of the type having a housing, an elastic ring support means carried by said housing, an elastic ring displacement means, a means for causing a relative movement of said support means to said displacement means for displacing an elastic ring off of said support means in a manner to perform a tubal ligation, the improvement which comprises:
(a) an anatomical element grasping means slidable in said support means, with a channel between said grasping means and said support means;
(b) a means for receiving an anesthetic agent on said housing, said receiving means having a channel therethrough, said grasping means adapted so that said channel between said grasping means and said support means communicates with the channel of said receiving means so as to introduce an anesthetic agent to a grasped anatomical element;
(c) actuating means for reciprocally sliding said grasping means axially along said support means, said receiving means communicating with said channel between said grasping means and said support means during only a portion of said reciprocal sliding motion.

4,230,117
STEREOTAXIC APPARATUS

Andrei D. Anichkov, ulitsa Blokhina, 6/3, kv. 4, Leningrad, U.S.S.R.

Filed Oct. 25, 1978, Ser. No. 955,026
Claims priority, application U.S.S.R., Feb. 27, 1978, 2580704
Int. Cl.[3] A61B 19/00
U.S. Cl. 128—303 B 2 Claims

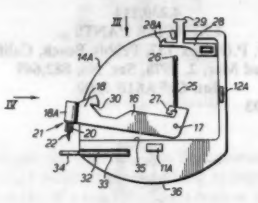


1. A stereotaxic apparatus comprising a ring sized to fit around the head of a patient, said ring having a plurality of head clamps, a spatial hinge having a first and a second portion, said first portion being movable with respect to said second portion through two degrees of freedom, said first portion being mounted on said ring so as to be movable therealong, an elongated bar having first and second ends, said first end being connected to said second portion of said hinge, a bushing adapted to be mounted on said bar so as to be movable therealong and rotatable thereabout, an elongated arc-shaped plate, means including a guide member of said plate for connecting said plate to said bushing so that said plate may be moved lengthwise with respect to said bushing, said bar being disposed radially with respect to an arc defining the shape of said plate, said means for connecting including means for securing said plate to said bushing, a stereotaxic instrument comprising an elongated rod having two ends, said instrument being mounted on said plate so that one end of said stereotaxic instrument is positioned at a point which is the projection of the center of curvature of the arc defining the shape of said plate on the axis of said bar.

4,230,118
AUTOMATIC LANCET

Rury R. Holman, 42 Meadow Close, Farmoor, and Robert C. Turner, May Cottage, Great Milton, both of England

Filed Aug. 4, 1978, Ser. No. 931,154
Claims priority, application United Kingdom, Aug. 5, 1977, 33029/77
Int. Cl.[2] A61B 17/34
U.S. Cl. 128—314 7 Claims



1. A lancet device which comprises:
a housing;
a movable arm pivoted in the housing for rotation about a pivot therein through a limited angle;
a holder at one end of the arm remote from the pivot, the holder being adapted to receive a replaceable mounted lancet needle and to hold the latter by its mounting pointing in the tangential direction;
spring means acting on the arm to bias it angularly for rotation about its pivot from a retracted position towards an operative position in which the point of a mounted lancet needle carried in the holder will be exposed projecting forwardly for a pricking operation; and
releasable latch means for holding the arm in the said retracted position against the force of the said spring means;
said latch means including a manually-operable trigger for releasing said latch means, whereby on release of said latch means the arm will be urged forwardly by said spring means to rotate into its operative position to perform a pricking operation;
said spring means having a characteristic such that the resultant biasing torque which it exerts on the arm reduces progressively in magnitude as the arm rotates from its retracted position towards its operative position until the arm reaches a neutral position shortly before its operative position, the resultant biasing torque reaching zero in said neutral position of the arm and thereafter reversing in angular direction to increase progressively as the arm is carried by inertia towards its operative position against the reversed biasing torque, whereby the said spring

means will tend to retract the arm from its operative position towards and into its neutral position so that the tip of the needle is automatically withdrawn after a pricking operation.

4,230,119

MICRO-HEMOSTAT

Alvin S. Blum, Fort Lauderdale, Fla., assignor to Medical Engineering Corp., Racine, Wis.

Filed Dec. 1, 1978, Ser. No. 965,623
Int. Cl.³ A61B 17/12
U.S. Cl. 128—325 6 Claims

1. A micro-hemostat useful in micro-surgery during anastomosis of blood vessels comprising

(a) a highly flexible tubular bar having a flexible, relatively inelastic inner wall and a flexible elastic outer wall, said walls being joined together at the ends of the bar to form an annular chamber defined by the space between the walls, said inner wall forming a passage through which uninterrupted blood flow takes place when the tubular bar is placed within a blood vessel;

(b) means preventing said outer wall from expanding when the chamber is pressurized except for areas adjacent each end of the bar which can be inflated under pressure to form annular cuffs; and

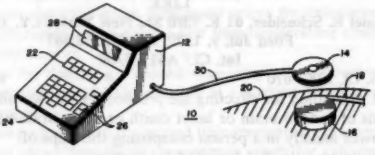
(c) a tubular stem attached at one end to the outer wall of said bar between said cuff areas at a point intermediate the length of the bar permitting said chamber to he pressurized therethrough, said stem having a passage therethrough which communicates with the annular chamber.

4,230,120

ENERGY COMPENSATION MEANS FOR DIGITAL CARDIAC PACEMAKER

Ray S. McDonald, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 957,958
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PT 36 Claims



1. A digital cardiac pacemaker pulse generator for providing a cardiac stimulating pulse comprising:

battery means for providing a voltage which changes with time;

means for providing a rate signal manifesting that said cardiac stimulating pulse is to occur;

voltage controlled oscillator means for providing a chain of pulses having a frequency related to the voltage provided by said battery means;

counter means for counting the voltage controlled oscillator pulses applied thereto, said counter means being reset to an initial count in response to said rate signal; and

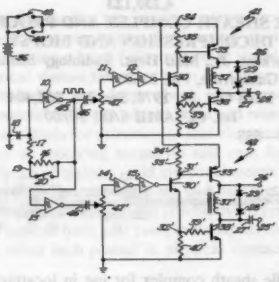
output means responsive to said counter means for providing said cardiac stimulating pulse at a voltage related to said battery voltage from the time said counter means is reset by said rate signal until said counter means reaches a predetermined value.

4,230,121

ELECTRICAL BODY STIMULATOR

David J. Stanton, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 29, 1979, Ser. No. 7,306
Int. Cl.³ A61N 1/36
U.S. Cl. 128—422 10 Claims



1. In an electrical body stimulator of the type having driving pulse generating means and driving pulse responsive means, including output means, for providing body stimulation signals, the improvement wherein said driving pulse generating means comprises:

energy storage means;

oscillating power supply means connected to said energy storage means for alternately charging and discharging said energy storage means; and

threshhold means including dual state means responsive to the charge level of said energy storage means for changing state in response to predetermined changes in said energy storage means charge, said driving pulse responsive means comprising means responsive to the period between changes of state of said dual state means for establishing the stimulation signal amplitude in accordance therewith.

4,230,122

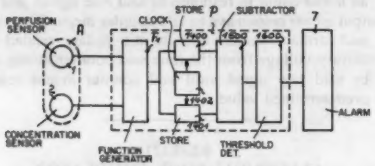
TRANSCUTANEOUS MONITORING OF CRITICAL PERFUSION-EFFICIENCY SITUATIONS

Dietrich W. Lübbers, Dortmund, and Albert Huch, Marburg, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft fuer Foerderung der Wissenschaften, Goettingen, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 937,946
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1977, 2737709
Int. Cl.³ A61B 5/00, 5/02
U.S. Cl. 128—635 34 Claims

1. An apparatus automatically detecting critical perfusion-efficiency situations, comprising, in combination, first means operative for transcutaneously sensing perfusion and generating a corresponding first signal; second means operative for transcutaneously sensing the concentration of an indicator substance transported by the blood perfused through the tissue

of interest and generating a corresponding second signal; an alarm generator; and signal-processing means connected to the first and second means for receipt of the first and second signals and connected to the alarm generator and operative for triggering the latter upon detection of signal changes meeting at least one predetermined rate-of-signal-change criterion.

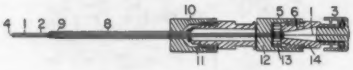


4,230,123

NEEDLE SHEATH COMPLEX AND PROCESS FOR DECOMPRESSION AND BIOPSY

Irvin F. Hawkins, Jr., Mail Dept. Radiology Shands Teaching Hospital, Gainesville, Fla. 32601

Filed Oct. 31, 1978, Ser. No. 956,404
Int. Cl.³ A61B *6/00, 10/00*
U.S. Cl. 128—658 **5 Claims**



1. A needle sheath complex for use in locating, removing matter from, and inserting devices in human bodies and animal bodies consisting of:

a. a probe cannula of tubular shape and consistent diameter having a small enough outer diameter to penetrate sensitive organs, arteries, and other body structures without doing substantial damage;

b. a stylus slidably located within said probe cannula with a diameter which fills said probe cannula, said stylus having a sharp piercing end and being enough longer than said probe cannula to project slightly from the end of said probe cannula to provide a cutting end;

c. an outer sheath of tubular shape slidably located over said probe cannula having an inside diameter large enough to remove matter from or insert devices in said bodies, said outer sheath being long enough to extend from the target in the body to the outside of the body and said probe cannula being at least twice that length;

d. Means for locking said stylus within said probe cannula in position, said means being removable from said probe cannula so that said outer sheath may be removed from said probe cannula whereby said outer sheath may be replaced with an outer sheath which is more rigid, less rigid, or larger in diameter, or capable of procedures different from the outer sheath removed without removing said probe cannula from the body.

4,230,124

OUTPUT DISPLAY FOR B-SCAN ULTRASONOSCOPE

Norman C. Pickering, and Nathaniel R. Bronson, II, both of Southampton, N.Y., assignors to High Stoy Technological Corporation, Bohemia, N.Y.

Filed Sep. 1, 1978, Ser. No. 939,090
Int. Cl.³ G01S *9/66*
U.S. Cl. 128—660 **13 Claims**

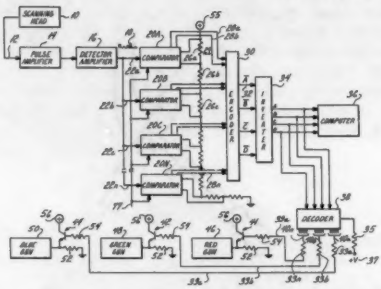
1. A B-scan ultrasonoscope for displaying a medium comprising:

ultrasonic transmitter means for radiating ultrasonic signals into a medium;

ultrasonic receiving means for receiving the echo-pulses reflected from portions of the medium, and for providing electrical signals corresponding to the echo pulses, the amplitude of the electrical signas corresponding respectively to the intensity of the echo pulses;

conversion means for converting the amplitude of each electrical signal into a digital value, the digital values extending over a range of values corresponding to the intensity range of the echo pulses;

color display means capable of displaying colors ranging over a color scale;



decoding means for dividing said range of digital values into continuous incremental steps, and identifying the corresponding step of each digital value; and

coupling means for coupling alternate ones of said incremental steps to said color display means for causing each of said alternate steps to display a respective incremental discrete color from said color scale, with the remaining ones of the incremental steps providing a black output on the color display means, whereby the medium is displayed in colors outlined in bands of black to enhance visual acuity and identify surface interfaces within the medium.

4,230,125

METHOD AND APPARATUS FOR EFFECTING THE PROSPECTIVE FOREWARNING DIAGNOSIS OF SUDDEN BRAIN DEATH AND HEART DEATH AND OTHER BRAIN-HEART-BODY GROWTH MALADIES SUCH AS SCHIZOPHRENIA AND CANCER AND THE LIKE

Daniel E. Schneider, 61 E. 93rd St., New York, N.Y. 10028

Filed Jul. 9, 1979, Ser. No. 55,567
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—670 **9 Claims**

1. A method for effecting the prospective forewarning diagnosis of sudden brain or heart death or other brain-heart and growth malady in a person comprising the steps of:

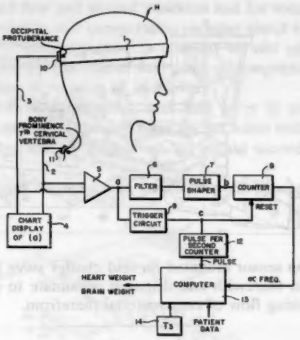
measuring the T-3 factor of the person;

measuring the alpha frequency of the brain of a person as a function of the person's pulse rate;

calculating the heart and brain weight as volume×specific gravity as a function of the alpha frequency, pulse and the T-3 factor; and

comparing the measured T-3 factor and the calculated heart and brain weight as volume×specific gravity to the normal values for the person's age;

whereby the deviation from the normal values is indicative of a prospective forewarning of sudden heart or brain



death or other brain-heart and growth malady and effects the forewarning diagnosis thereof.

4,230,126

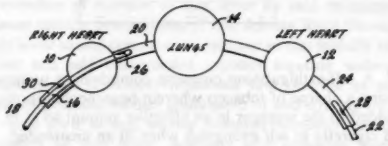
APPARATUS AND METHOD FOR MEASURING EXTRAVASCULAR LUNG WATER

Virgil B. Elings, P.O. Box 6075, Santa Barbara, Calif. 93111

Continuation-in-part of Ser. No. 940,114, Sep. 6, 1978, abandoned. This application Nov. 20, 1978, Ser. No. 962,308

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—671 **44 Claims**



1. Apparatus for providing a measure of extravascular lung water of a subject using a single thermal indicator, including

means for providing an injection of the thermal indicator into the bloodstream of the subject at a position proximal to or in the right heart,

means for detecting a first time-temperature concentration curve of the bloodstream at a position in the pulmonary artery,

means responsive to the first time-temperature concentration curve detected in the pulmonary artery for calculating a characteristic time for the first time-temperature concentration curve,

means for detecting a second time-temperature concentration curve of the bloodstream at a position in a systemic artery,

means responsive to the second time-temperature concentration curve detected in the systemic artery for calculating a characteristic time for the second time-temperature concentration curve,

means for calculating the flow of blood through the heart and lungs, and

means for calculating a measure of extravascular lung water in accordance with the product of the blood flow times the difference between the characteristic times for the first and second time-temperature concentration curves.

4,230,127

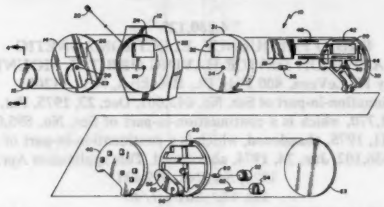
CARDIAC MONITORING APPARATUS

Lary R. Larson, Tempe, Ariz., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed May 24, 1978, Ser. No. 909,230

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—706 **4 Claims**



1. In a portable cardiac rate monitor adapted to be worn on one wrist including case means for housing electrical means capable of detecting a Lead I electrocardiac signal in response to the electrical signals taken between two upper limbs, said case means including a conductive back, which is adapted to be in physical contact with one of said limbs and receiving one of said electrical signals for provision to said electrical means, the improvement of receiving means on said case for providing said other electrical signal to said electrical means comprising:

a conductive layer insulated from said backing;

a dielectric layer affixed to said conductive layer on the side thereof remote from said case, and adapted to have a part of said other limb placed in physical contact therewith; and

a conductive rubber means connecting said conductive layer and said electrical means.

4,230,128

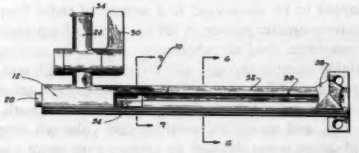
CATHETER ATTACHMENT FOR BLOOD SAMPLING

Rene S. Aramayo, 3209 N. Military Rd., Arlington, Va. 22207

Filed Mar. 30, 1978, Ser. No. 891,888

Int. Cl.² A61B *10/00*

U.S. Cl. 128—763 **6 Claims**



1. An attachment to be utilized in conjunction with a catheter and syringe, comprising: housing means, adapted to be fixedly secured to a catheter, comprising a housing wall formed as a thin-walled structure and fabricated of a resilient plastic material and fluid flow passageway means for fluidically connecting said housing means with a catheter when secured thereto; mounting means on said housing, adapted for mounting a syringe thereon and providing fluid connection therewith with said fluid flow passageway means; a sealing stylet reciprocatively disposed within said housing between two extreme positions for periodically blocking the flow of fluid through said fluid flow passageway means, said fluid flow to said housing being blocked when said stylet is disposed in said first position, and said fluid being permitted to flow to said housing and said mounting means when said stylet is disposed in said second position; handle means for manipulating said stylet between said two extreme positions; a control means for periodically blocking the flow of fluid from said fluid flow

passageway means through said mounting means; and means for maintaining said stylet substantially sterile comprising normally closed slot means defined within said housing wall through which said means for manipulating said stylet projects; whereby said slot means is substantially closed, except within the immediate vicinity of said handle means, so as to maintain the interior of said housing substantially sterile.

4,230,129

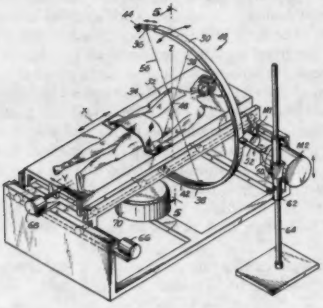
RADIO FREQUENCY, ELECTROMAGNETIC RADIATION DEVICE HAVING ORBITAL MOUNT

Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 643,661, Dec. 23, 1975, Pat. No. 3,991,770, which is a continuation-in-part of Ser. No. 595,094, Jul. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,102, Jan. 24, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,431

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—804 **5 Claims**



1. Apparatus for treating tumors and the like in an animal host, comprising:

a yoke, an elongated member slidably mounted on said yoke for movement therealong on an arcuate path, a pair of radio frequency applicators mounted on said slidable member fixed in diametrically spaced relationship and directed toward each other, said applicators being adapted to be connected to a source of radio frequency electromagnetic power to set up a radio frequency electromagnetic field therebetween, means for moving said slidable member through said arcuate path with said applicators in said fixed spaced relationship to each other such that said applicators move through an arcuate path about an axis, and means for rotating said yoke whereby said applicators move through an arcuate path about a second axis intersecting said first named axis at a point at which a said tumor in an animal host is locatable.

4,230,130

COMBINE GRAIN LOSS SENSING

Richard W. Staiert, Geneseo, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 5, 1979, Ser. No. 8,996

Int. Cl.³ A01F *12/00*

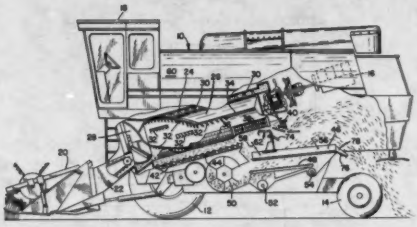
U.S. Cl. 130—27 R **8 Claims**

1. In an axial flow combine, the combination comprising:

a generally cylindrical rotor casing having an open end for reception of crop material and further having a grate through which crop material may exit from the casing;

a rotor journalled for rotation within said casing for threshing crop material introduced into said casing and impelling portions thereof out of said casing through said grate;

a crop cleaning system including a chaffer sieve reciprocably mounted beneath said grate for sifting crop material therethrough; and



a crop sensor mounted on said chaffer sieve for reciprocation therewith and disposed proximate to said grate for sensing flow of crop material therefrom.

4,230,131

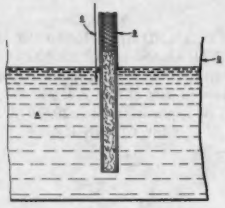
SELF-EXTINGUISHING CIGARETTES

Eli Simon, 7175 Little Harbor Dr., Huntington Beach, Calif. 92648

Filed Mar. 9, 1979, Ser. No. 11,129

Int. Cl.³ A24D *1/10*

U.S. Cl. 131—4 A **4 Claims**



1. A self-extinguishing cigarette comprising a wrapper enclosing a charge of tobacco wherein benzenephosphonic acid is added to the wrapper in an effective amount so as to cause said cigarette to self extinguish when lit an unattended.

4,230,132

CIGARETTE MAKING MACHINE

David Crisp, London, England, assignor to Rizla Limited, Glamorganshire, Wales

Filed Nov. 27, 1978, Ser. No. 963,993

Claims priority, application United Kingdom, Nov. 28, 1977, 49401/77

Int. Cl.³ A24C *5/02, 5/39, 5/42*

U.S. Cl. 131—70 **10 Claims**

1. A cigarette making machine comprising:

a fixed member having a first semi-cylindrical surface;

a compression member having a second semi-cylindrical surface and arranged for translational movement between a first position in which said first and second surfaces are radially spaced and a second position in which said members abut, said first and second surfaces together forming a space in which a charge of tobacco is compressed into a cylindrical plug;

means defining a slot through which said charge of tobacco can be inserted, with the compression member in the first position, into a space between said first and second surfaces;

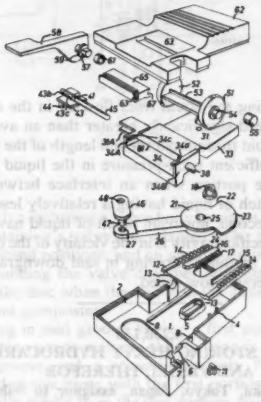
a nozzle communicating with an end of said cavity and adapted to receive the end of a preformed paper tube;

means for ejecting said cylindrical plug of compressed tobacco through said nozzle into said paper tube;

a lever pivotally secured to said compression member for translational movement together with said compression member between said first and second positions and for rotational movement relative to said compression member about a pivot point, said lever being operatively coupled to said ejection means for producing ejection of said plug of compressed tobacco in response to rotation of said lever;

restraining means cooperating with said lever to prevent rotational movement of said lever except when said compression member and said lever are in said second position; and

actuating means engaging said lever at a point spaced from



said pivot point for applying a driving force thereto in a direction from said first position to said second position, prevention of rotation of said lever by said restraining means causing transmission of said driving force through said lever to said compression member so that initially said lever and said compression member together undergo translational movement from said first position to said second position, further application of said driving force to said lever at said second position thereafter causing rotation of said lever, whereby said actuating means causes a charge of tobacco to be compressed and then ejected through said nozzle into said paper tubes to form a finished cigarette.

4,230,133

HAIR CURLER

Bodo Aniszewski, Ahrensburger Weg 57, Hamburg, and Willy Ehmann, Friedrichstrasse 8a, Heidelberg, both of Fed. Rep. of Germany

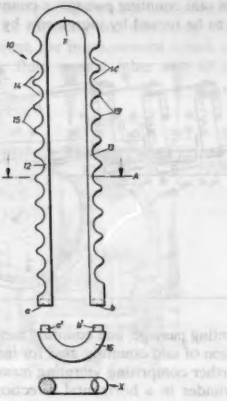
Filed Apr. 25, 1978, Ser. No. 899,846

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719344; May 20, 1977, 2722976; Dec. 3, 1977, 2753987

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **4 Claims**

1. A hair curler comprising two like rods extending in a longitudinal direction from one end to another end and a bridge connecting the one ends of the rods to form a hairpin-like shape, the rods being of rounded cross section in a plane transverse to the longitudinal direction and diametrically opposite outer sides of the rods being undulated, the undulated outer side of one of the rods defining troughs staggered in the



longitudinal direction relative to the troughs defined by the undulated outer side of the other rod.

4,230,134

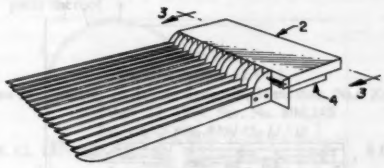
INSTRUMENT FOR USE IN HAIR CUTTING

Edwin C. Pérez, R.F.D. 2 Buzon 198, Carretera 175, Rio Piedras, P.R. 00928

Filed Jul. 31, 1978, Ser. No. 928,277

Int. Cl.³ A45D *24/36*

U.S. Cl. 132—45 R **3 Claims**



1. A hand held device for use in holding the hair during a hair cutting proceduce, comprising two elongated backing members positioned in surface-to-surface longitudinal sliding engagement, a plurality of spaced parallel teeth extending from each backing member in a direction transverse to the longitudinal lengths thereof, the teeth of the respective backing members being alternately positioned and all teeth lying in substantially the same plane, resilient means constantly urging the teeth of one of the backing members into engagement with those of the other backing member, and means for separating the teeth against the force of the resilient means.

4,230,135

SORTED COIN COUNTING APPARATUS

Nobuo Ueda, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

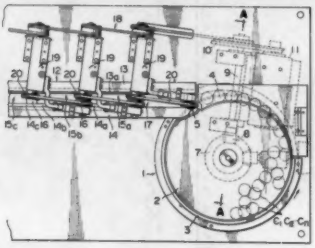
Filed Jan. 3, 1979, Ser. No. 665

Int. Cl.³ G07D *3/02*

U.S. Cl. 133—3 D **3 Claims**

1. A sorted coin counting apparatus for counting the number of various kinds of such mixed coins falling into various selecting holes formed in the bottom of a coin selecting track, selectively in accordance with the kinds thereof, while being unidirectionally conveyed on said selecting track, comprising: a stacking cylinder for stacking therein the kind of coins which have fallen into the corresponding selecting hole; a counting

passage leading from said stacking cylinder; a counting conveyor belt mechanism for feeding the coins stacked in said stacking cylinder to said counting passage and for conveying the same on said counting passage; a counting gear shaped and positioned to be turned by increments by the coins conveyed



on said counting passage; and counting means made responsive to the rotation of said counting gear for indicating the number of coins, further comprising vibrating means for vibrating said stacking cylinder in a horizontal direction so that the coins may be stacked one on another in said stacking cylinder.

4,230,136

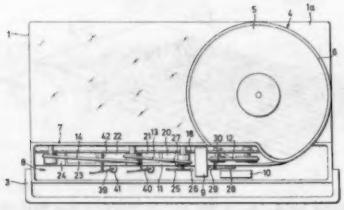
DEVICE FOR COUNTING AND SORTING COINS

Friedrich Heinrichs, Steinstrasse 66, D-5090 Leverkusen 3, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 799,095, May 20, 1977, abandoned. This application Mar. 29, 1979, Ser. No. 25,289

Int. Cl.³ G07D *3/02*

U.S. Cl. 133—3 E **10 Claims**



1. A device for counting and sorting coins of various sizes, comprising a supply container for unsorted coins; said supply container having a base in the form of a rotatable disc; a guide channel adjacent said supply container for guiding the coins therefrom individually and successively; said guide channel being provided with a continuous reference edge and having a base provided with openings which correspond in size to the size of the types of coin; a counter for detecting coins in the guide channel without contact; at least one lever mounted for pivotal movement about an axis running perpendicular to the direction of travel of the coins in the guide channel; and the said lever having a free end which is urged toward the reference edge by a spring.

4,230,137

APPARATUS AND METHOD FOR SLACK FLOW ELIMINATION IN A SLURRY PIPELINE

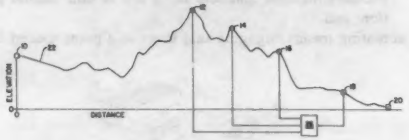
Thomas C. Aude, Orinda, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 24, 1978, Ser. No. 899,429

Int. Cl.³ G05D *7/03*

U.S. Cl. 137—8 **17 Claims**

1. In a method for operating a pipeline traversing terrain at varying elevations including at least one relative high point of the pipeline followed by a pipeline downgrade portion, the method including the steps of feeding batches of liquid with differing specific gravities into an upstream end of the pipeline, pressurizing the liquid sufficiently so as to flow it through the pipeline to the downstream end thereof and so that the flowing liquid substantially fills the entire cross-section of the pipeline, and withdrawing the liquid from the downstream end at substantially the same rate at which the liquid is fed into the upstream end of the pipeline, the improvement comprising the



step of preventing the liquid from flowing in the downgrade portion at a speed significantly greater than an average flow speed of the liquid throughout the full length of the pipeline by generating a sufficient back pressure in the liquid flowing in said downgrade portion when an interface between a first, downstream batch of liquid having a relatively lesser specific gravity and a second, upstream batch of liquid having a relatively larger specific gravity is in the vicinity of the downgrade portion so that the liquid flowing in said downgrade portion flows at the average flow speed.

4,230,138

METHOD OF STORING HEAVY HYDROCARBON OIL AND VESSEL THEREFOR

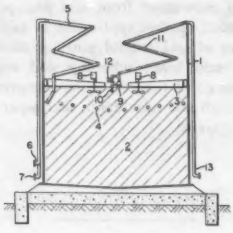
Hiroshige Tanaka, Tokyo, Japan, assignor to Nihon Sekiyu Hanbai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,906

Claims priority, application Japan, Mar. 31, 1977, 52-36590; May 12, 1977, 52-54786; Jan. 27, 1978, 53-8024

Int. Cl.³ F28D *1/06*

U.S. Cl. 137—13 **11 Claims**



9. A method of storing materials including high temperature liquefiable hydrocarbon oils or mixtures of such oils with other materials comprising the steps of loading a liquid material including hydrocarbon oil having a pour point higher at least than the environmental temperature into a storage vessel in a state heated up to a temperature above its pour point, a heating means being embedded in an upper portion of the liquid material in the storage vessel, allowing the hydrocarbon oil to cool down to a temperature below the pour point and solidify in said vessel, storing the material in its solidified form, and heating the upper portion of the solidified material including the hydrocarbon oil up to a temperature above its pour point by the embedded heating means to prepare the vessel and heating means therein for a change in the amount of material stored in the vessel; said heating being carried out by said heating means which is mounted on and dependent from a floating body disposed in said vessel and supported by the stored materials,

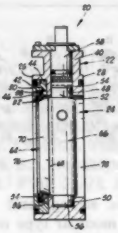
and wherein said heating action occurs in a layer extending across said vessel.

4,230,139

DISC VALVE

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Filed Nov. 13, 1978, Ser. No. 959,719
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—74 **15 Claims**



1. In a valve including a valve body having a valve chamber therein containing a valve disc adapted to be turned between open and closed positions, and an annular groove in the valve body surrounding the valve chamber opposite the outer periphery of the disc when the disc is in the closed position, the improvement comprising:

a seat ring in said groove having a first portion relatively inflexible so as to maintain the seat ring in position within said groove and a second relatively flexible portion formed as one piece with the first portion and extending generally axially from the first portion, the second portion terminating in an unsupported free end such that the first portion of the seat ring provides support for one end of the second portion thereof and the other end of the second portion of the seat ring is unsupported against radial contraction, and wherein the second portion has an outer diameter less than the diameter of said groove to form a cavity around the second portion;

first means forming a first vent between the valve chamber at one side of said groove and said cavity at one end of the relatively flexible portion of the seat;

second means forming a second vent between the valve chamber at the opposite side of said groove and said cavity at the opposite end of the relatively flexible portion of the seat; and

elastomeric means in said cavity for closing the first vent when the second vent is exposed to the higher pressure and for closing the second vent when the first vent is exposed to the higher pressure so that the larger fluid pressure exerted at either side of the disc with the disc in a closed position is transmitted to said cavity to force the relatively flexible portion of the seat ring against the disc.

4,230,140

ENVIRONMENTAL FIRST STAGE SCUBA REGULATOR

Dennis L. Hart, Hacienda Heights, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Jan. 15, 1979, Ser. No. 3,400
Int. Cl.³ B63C *11/22*
U.S. Cl. 137—81.2 **6 Claims**

1. In a first stage regulator for use with a high pressure source of breathable gases and a second stage demand regulator:

(a) a regulator body having a piston chamber;

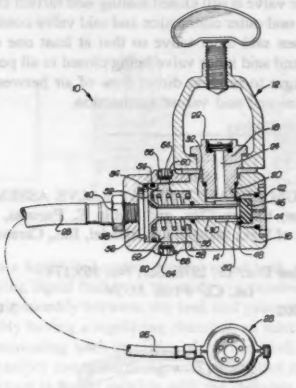
(b) a piston in the chamber and slidable therein, said piston dividing said chamber into two sides;

(c) means forming an outlet from one side of the chamber;

(d) valve means operable upon movement of the piston into said one side for opening a passage for breathable gases from said high pressure source to said one side of said piston chamber and operable upon movement of the piston away from said one side for closing said passage;

(e) means forming an opening into the said other side of said piston chamber for exposing said other side of said piston chamber to ambient; the improvement which consists of:

(f) an inert barrier fluid in said other side of said piston chamber;



(g) a porous plug at said opening and having a porosity to inhibit outflow of said barrier fluid while permitting relatively free passage of water therethrough;

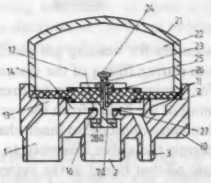
(h) said barrier fluid being substantially immiscible with water whereby water entering said other side of said piston chamber is isolated from said piston and associated parts thereof.

4,230,141

PULSATOR VALVES

Evan M. Phillips, 26 Acacia Crescent, Hamilton, New Zealand

Filed Apr. 13, 1978, Ser. No. 896,145
Int. Cl.³ F16K *31/145, 11/02*
U.S. Cl. 137—103 **8 Claims**



1. A milking machine pulsator valve comprising a valve body, a diaphragm mounted in said body for flexing movements when exposed on one surface thereof to pressure fluctuations, means for exposing said one surface of said diaphragm in use to a pressure alternating between atmospheric pressure and a lower pressure in pulse alternations, an annular valve seat separating said body into an outer chamber and an inner chamber, part of said diaphragm coacting with said annular valve seat to form an annular valve between said chambers, said outer chamber having an outer connection thereto and said inner chamber having a valve connection and a further connection thereto, said valve connection having an inner valve comprising an inner valve seat on an outer face of said valve connection and a cooperating valve member connected by a valve stem to said diaphragm to contact said inner valve seat and close said valve connection when said lower pressure is

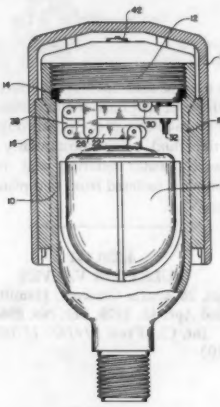
initially applied to said one surface, said annular valve seat and said diaphragm being relatively positioned so that on application of said lower pressure to said one surface said diaphragm flexes off said annular valve after said co-operating valve member contacts said inner valve seat to close said inner valve and on application of atmospheric pressure to said one surface and application of a lower pressure to said inner chamber said diaphragm flexes to first close onto said annular valve seat while said inner valve is still closed sealing said further connection from both said outer connection and said valve connection and to then open said inner valve so that at least one of said annular valve and said inner valve being closed in all positions of said diaphragm to prevent direct flow of air between said outer connection and said valved connection.

4,230,142

VENT/VACUUM BREAKER FLOAT VALVE ASSEMBLY

Myrl J. Saarem, Carson City, and Philip E. Parsons, Silver Springs, both of Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Dec. 13, 1978, Ser. No. 969,174
Int. Cl.³ F16K *31/24*
U.S. Cl. 137—202 **3 Claims**



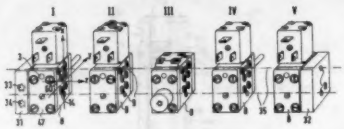
1. A valve assembly for venting gas contained in a pressurized liquid system during filling of the system and for breaking any tendency for vacuum effects to be created in the system during the draining of the liquid from the system, said assembly including: a valve body defining an inner chamber and adapted at one end to permit the valve assembly to be coupled to the system during use so that liquid in the system enters the inner chamber; a float assembly; a cap fitted into the other end of the valve body to enclose said other end and to support said float sub-assembly in said inner chamber; sealing means positioned between said cap and said other end of said body; said cap having a vent port extending into said inner chamber; a movable sealing member for selectively closing the vent port; a plurality of levers coupling the sealing member to the float sub-assembly to cause the sealing member to be forced against the vent in sealing relationship therewith as liquid enters the chamber and displaces the float sub-assembly upwardly in the chamber; a spring loaded valve mounted in said cap in position to be closed when the inner chamber is pressurized but to open and break the vacuum effects of the chamber when the liquid therein is drained so as to reduce the internal pressure of the inner chamber; and a cover enclosing the cap and valve body to insulate the valve assembly and reduce the tendency of the liquid within the valve assembly to freeze.

4,230,143

CONTROL VALVE ARRANGEMENT FOR DENTAL EQUIPMENT

Heinrich Dettmann, Niedernhall, and Otto Mehrer, Öhringen, both of Fed. Rep. of Germany, assignors to Bürkert GmbH, Ingelfingen, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 962,821
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752938
Int. Cl.³ A61C *19/00*
U.S. Cl. 137—270 **10 Claims**



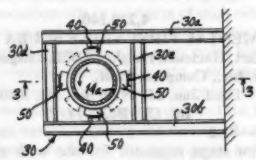
1. A control valve arrangement for dental equipment, wherein at least two modular type control valve assemblies having at least three functional zones are combined into a control group disposed between end closure elements and arranged to be clamped to form an entity, wherein aid modules are clamped together in one direction by longitudinal tie rods and have channels for control and supply media made up of channel sections having ports which are joined together, said channels arranged to extend in said one direction of said modules, further wherein said modules comprise substantially identical bodies having at least two sides with said ports disposed in said sides, which are arranged to be clamped together with each said module having said ports arranged symmetrically to a normal central plane (ZX) which extends in said one direction of clamping, each said module further being provided with a cross chamber terminating in a valve seat, said cross chamber having a geometrical axis (Y) which extends perpendicular to said one direction of clamping of said modules and is intersected at an intersection point at right angles by a central geometrical vertical axis (x) of said module, said module including a third geometrical axis (z) passing through said intersection point and extending at right angles to said geometrical axis (y) and said vertical axis (x), and that in the interior of each module there are provided further channel sections which extend between the ports disposed in said sides.

4,230,144

SEISMIC SUPPORT FOR PENDANTLY SUSPENDED BODY

Dennis W. Chalmers, Charlotte, Vt., assignor to Hayward Tyler Pump Company, Chittenden, Vt.

Filed Jun. 6, 1979, Ser. No. 45,858
Int. Cl.³ F16L *3/00*
U.S. Cl. 137—343 **11 Claims**



5. Apparatus for supporting a pendantly mounted sump pumping apparatus, or the like, against lateral or pendulous movement of its lower portion when submerged; in an excavation comprising:

means fixed on the wall of said excavation for surrounding the lower portion of the pumping apparatus;

a plurality of spaced abutting members fixed to and disposed about the periphery of said apparatus adjacent said surrounding means; and

a plurality of spaced abutment means mounted on said surrounding means for respectively abutting said abutting members with a small clearance fit to secure said apparatus against movement, the space between said abutting members and abutment means being such as to permit them to pass through their respective interstices.

4,230,145

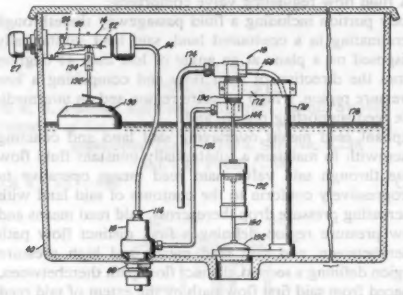
FLUID CONTROL VALVE

Edwin T. Badders, 3087 Riverside Dr., Pomona, Calif. 91766

Continuation-in-part of Ser. No. 745,673, Nov. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 553,590, Feb. 27, 1975, Pat. No. 3,994,029. This application Mar. 13, 1978, Ser. No. 885,593

Int. Cl.³ F16K *31/18, 33/00*

U.S. Cl. 137—410 **9 Claims**



1. A valve assembly for selectively controlling fluid flow therethrough to rapidly create and discharge a pressure drop thereacross, said assembly comprising a valve support structure, a needle valve member carried by said valve support structure and having a tapered end portion, a chamber disposed in said valve support structure for the passage of fluid therethrough, valve inlet means disposed in said structure for communicating said chamber with a fluid supply, a valve stem slidably mounted within said chamber, an annular valve seat carried by said stem in axial alignment with said needle valve member for selective sealing engagement with the tapered end portion thereof, means for moving said needle valve member from said annular valve seat, means for moving said valve seat from said needle valve member upon said needle valve being moved from said valve seat, and means for moving said needle valve member toward said valve seat to reduce the flow of fluid through said chamber and cause said valve seat to be forced by said fluid flow into sealing engagement with said tapered end of said needle valve member.

3. The combination of claim 1 wherein said means for moving said needle valve comprises a cntrol lever pivotally mounted on said valve housing and having a camming surface thereon, said needle valve being pivotally carried by said control lever such that rotation of said control lever causes said needle valve to undergo linear movement with respect to said valve seat and a follower rod adapted to abut said camming surface and impart rotational movement to said control lever.

5. The combination of claim 3 including a float member carried by said control lever for imparting rotational movement to said control lever causing said needle valve to move toward said valve seat upon said float being elevated with respect to said valve housing.

4,230,146

FUEL FEED SYSTEM

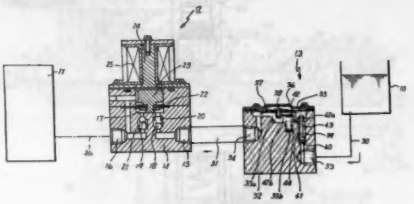
Hiroto Kobayashi, Kamakura, and Tsuneo Hashimoto, Shakujii, both of Japan, assignors to Walbro Far East, Inc., Kawasaki City, Japan

Filed Sep. 1, 1978, Ser. No. 938,766

Claims priority, application Japan, Sep. 10, 1977, 52-109053

Int. Cl.³ F16K *31/165*

U.S. Cl. 137—494 **5 Claims**



1. In a liquid fuel system having a fuel tank, a fuel pump for supplying liquid fuel from the tank to a combustor, and a fuel control assembly between the tank and pump with the control assembly having a regulating chamber, an inlet to the chamber communicating with an outlet of the fuel tank, an outlet from the chamber communicating with an inlet of the pump, and a diaphragm in sealed relation with the chamber and having one face communicating with the atmosphere, and an opposed face communicating with the interior of the chamber and liquid fuel therein, the improvement in said control assembly comprising a valve between the chamber and the inlet to the chamber, said valve being movable to opened and closed positions to control the flow of fuel from the tank into the chamber and constructed and arranged to be urged toward its opened position by a force produced on the valve by fuel from the tank, means operably connecting the diaphragm with said valve and constructed and arranged so that atmospheric pressure acting on said diaphragm urges said valve toward its opened position and fuel in the chamber acting on said diaphragm urges said valve toward its closed position, and yieldable means constructed and arranged to urge said valve toward its closed position with sufficient force to overcome the bias of said diaphragm and fuel from the tank to close said valve when the pump is inoperative while permitting said valve to open when the pump is operating, due to a decrease in the force produced by the fuel in the chamber acting on said diaphragm.

4,230,147

CONSTANT FLOW VALVE

Jack J. Booth; William C. Branch, and Robert P. Kidd, all of Dallas, Tex., assignors to Booth, Inc., Carrollton, Tex.

Filed Feb. 8, 1978, Ser. No. 876,001

Int. Cl.³ G05D *7/01*

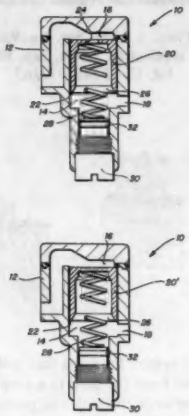
U.S. Cl. 137—504 **8 Claims**

1. A mechanism for automatically maintaining a uniform rate of fluid flow in a flow channel under varying pressures of a fluid source, comprising:

(a) a chamber forming part of said flow channel having an inlet port and a single outlet port through the side wall of the chamber;

(b) a piston disposed within said chamber sized to permit fluid flow around the periphery of the piston, said piston being axially displaceable within said chamber in response to the pressure of the fluid introduced into the chamber through the inlet port and radially displaceable by flow generated forces to maintain contact with the side wall of said chamber in the region of said single outlet port to

establish sliding contact of said piston over said outlet port to produce closure action of said outlet port; and



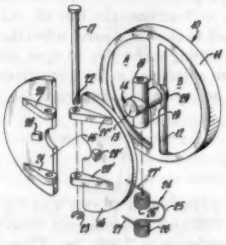
(c) spring means for yieldably opposing axial movement of said piston toward said outlet port.

4,230,148

CHECK-VALVE CONSTRUCTION

Francis H. Ogle, Jr., Chardon, Ohio, assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Apr. 6, 1979, Ser. No. 27,845
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—512.1 **11 Claims**



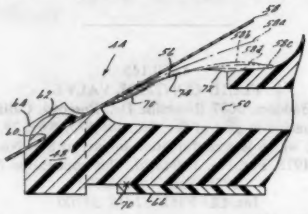
1. A check-valve assembly, comprising an annular valve body with a fluid-flow passage bore extending therethrough between upstream and downstream ends of said body, said body having valve-seat formations including a seat post diametrically spanning the bore of said body and defining two opposed generally semicircular seat openings to share flow via said passage, hinge means carried by said post on an axis located downstream from said seat openings and parallel to said post, said hinge means having end clearance with the bore of said body, and two valve members hinged to said body via said hinge means, said valve members having a valveclosing position in coaction with said seat formations for blocking fluid flow in the upstream direction and said valve members having a valve-open position for passage of fluid flow in the downstream direction.

4,230,149

FLUID FLOW REGULATING VALVE AND SYSTEM

Roger P. Worthen, Farmington Hills, and Michael M. Walsh, Northville, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 22, 1978, Ser. No. 908,026
Int. Cl.³ F16K *17/24*
U.S. Cl. 137—517 **15 Claims**



1. A fluid flow regulating valve comprising:

a body portion including a fluid passageway therethrough terminating in a contoured land, said land substantially disposed on a plane at an angle of less than 45 degrees from the direction of fluid flow and comprising a low pressure region, a high pressure region and an intermediate reed supporting region; and

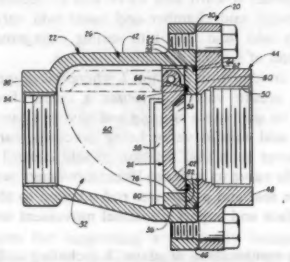
compliant reed means overlaying said land and coacting therewith to maintain a substantially constant fluid flow rate through said valve, said reed means operative to progressively conform to the contours of said land with increasing pressure drop thereacross, said reed means and low pressure region defining a first, distinct flow path therebetween, and said reed means and high pressure region defining a second, distinct flow path therebetween, spaced from said first flow path by the extent of said reed supporting region, a portion of said reed means conforming with said low pressure region to effect substantial closure of said first flow path at a first, relatively low predetermined pressure drop level and another portion of said reed means conforming with said high pressure region to effect at least partial closure of said second flow path at a second, relatively high predetermined pressure drop level.

4,230,150

TILTING DISC CHECK VALVE

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Filed Feb. 22, 1979, Ser. No. 14,124
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—527 **14 Claims**



13. A valve assembly for a tilting disc check valve comprising:

a clapper assembly, comprising:

a clapper support member having the form of an interrupted circular ring whereby the clapper support member has a bore formed therethrough interruption extending from the clapper support member bore to an outer peripheral surface thereof and extending therebetween substantially symmetrically about a radius of the circular ring;

a clapper, sized to fit within the bore formed through the clapper support member; and

a tab, formed on the clapper and extending therefrom into the interruption in the clapper support member, the tab being pivotally connected to the clapper support member for pivotation of the clapper into and out of the bore formed through the clapper support member; and

a ring-shaped seal member adjoining one side of the clapper support member to engage the clapper when the clapper is pivoted into the bore formed through the clapper support member.

4,230,151

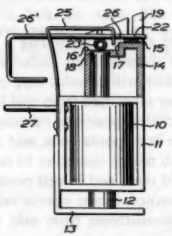
PINCH VALVE

Ulf R. S. Jonsson, Björkelund, Eggvall, Axvall, Sweden

Division of Ser. No. 836,136, Sep. 23, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,235

Int. Cl.³ F16K *11/00*

U.S. Cl. 137—595 **6 Claims**



1. A valve for controlling the flow of fluids through at least two conduits, comprising:

(a) support means, including a base, for retaining said conduits in substantially parallel relationship, but at different distances from said base;

(b) said support means including substantially parallel surfaces for supporting said conduits at said different distances from said base;

(c) a wire which, in its normal position, pinches closed a first of said conduits against a first one of said surfaces, while retaining a second of said conduits, supported by a second one of said surfaces, in an open condition;

(d) U-shaped leaf spring biasing means for urging said wire, to remain in its normal position, said wire passing through at least one leg thereof; and

(e) actuating means for displacing said wire against the force of said spring biasing means, from its normal position to a second position, so as to pinch closed said second conduit between said wire and a portion of said second surface and subsequently open said first conduit.

4. The valve set forth in claim 1 wherein said wire comprises a portion extending beyond said at least one leg for manually displacing said wire from said normal position to said second position.

4,230,152

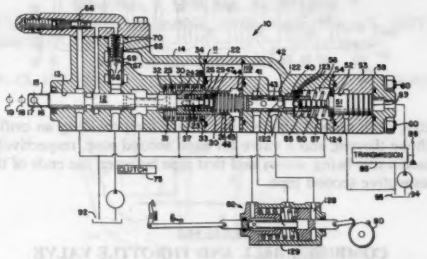
MULTI-FUNCTION CONTROL VALVE

David F. Carl, and Gary A. Drone, both of Springfield, Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Jan. 16, 1978, Ser. No. 869,458

Int. Cl.³ F15B *13/07*

U.S. Cl. 137—596 **12 Claims**



1. A multi-function control valve for controlling fluid flow and pressure in a fluid operated system comprising

a valve body having a bore, an inlet port, an outlet port, at least one sump port and a service port normally in fluid communication with said sump port,

fluid pressure and flow regulating means carried by said valve body for regulating fluid pressure and flow therethrough,

fluid pressure relief means carried by said valve body for limiting the pressure of fluid therein,

said valve body communicating said inlet port with said fluid pressure and flow regulating means, and communicating said fluid pressure relief means with said sump port,

a selectively positionable valve spool supported in the bore of said valve body for movement among positions to communicate said inlet port with said service port and to close communication between said service port and said sump port, and to close communication through said fluid pressure and flow regulating means and said sump port, and to communicate said inlet port with said fluid pressure relief means,

a fluid passageway formed in said valve body intersecting with said bore formed therein and connecting said fluid pressure and flow regulating means in fluid communication with said outlet port for passing fluid therethrough in a direction to apply a fluid pressure to control valve means,

control valve means supported in said bore for reciprocal movement in response to fluid pressure in said fluid passageway,

biasing means for applying a variable biasing force to said control valve means in a direction opposed to the direction of the force applied thereto by the fluid pressure in said fluid passageway, and

reaction means operatively connected between said valve spool and said biasing means for varying the biasing force of said biasing means in response to the positioning of said selectively positionable valve spool to control fluid pressure in said passageway.

4,230,153

BACK PRESSURE SYSTEM FOR SLURRY PIPELINE

Jay P. Chapman, Nampa, Id., assignor to Bechtel International Corporation, San Francisco, Calif.

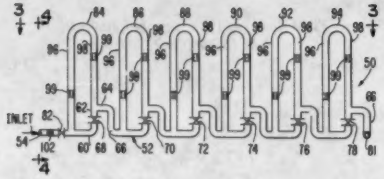
Filed Nov. 7, 1977, Ser. No. 849,061

Int. Cl.³ F16K *11/22*

U.S. Cl. 137—599 **10 Claims**

1. A back pressure system for a slurry pipeline comprising: a first pipe having a fluid inlet and a fluid outlet; a back pressure device for each of a number of spaced locations, respectively,

along said first pipe, each device including a generally inverted U-shaped second pipe having a pair of spaced, vertical sides and a pair of opposed open ends communicating with the first



pipe, each second pipe having means for providing an orifice choke therein; and a valve for each second pipe, respectively, each valve being across said first pipe between the ends of the respective second pipe.

4,230,154

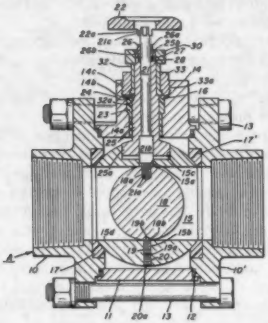
COMBINED BALL AND THROTTLE VALVE

Adolphe W. Kalbfleish, Box 64, Jeannette, Pa. 15644

Filed Dec. 15, 1978, Ser. No. 969,721

Int. Cl.³ F16K *43/00, 1/22*

U.S. Cl. 137—614.17 **5 Claims**



1. An improved ball and throttle valve construction having a demountable housing assembly of interfitting body parts that define a through-extending fluid passageway therethrough which comprises, a ball valve having a fluid-flow bore open therethrough and being operatively positioned for rotative opening and closing movement within the fluid passageway, said ball having a latching recess portion in its outer wall, a side boss open through the housing assembly to said ball, a first stem operatively positioned to extend within said boss and having a latching spline at its inner end adapted to operatively engage within said latching recess portion, a second stem operatively extending co-axially along and outwardly from an outer end portion of said first stem and inwardly through said spline and the wall of said ball into said bore, a disc-like throttle valve element operatively extending across and within said bore for rotative movement therein, an inner end of said second stem being secured to said throttle valve element, said first and second stems having end portions projecting outwardly from said boss, operating means on said stems that are positioned outwardly of said boss for respectively turning them to rotate said ball within the passageway of the housing assembly and to rotate said throttle valve element within said bore, gland means operatively sealing said first and second stems within said boss, and detachable positioning means cooperating with the gland means for operatively retaining said first stem within said boss and second stem within the first stem enabling endwise removal of said first stem from said boss and said second stem from said first stem, said first stem being of sleeve-like construction and having a central bore extending through said latching spline, and said second stem extending along said central bore through the wall of and into said bore of said ball and having means for demountably securing said throttle valve element thereto.

4,230,155

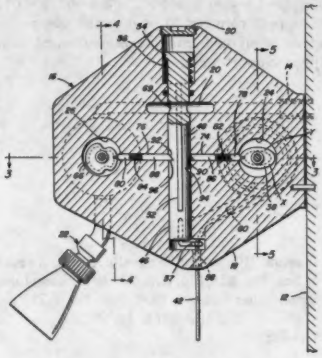
TIMED ON-OFF SEQUENCE SHOWER VALVE

Joe G. Frye, Sr., and Teresa J. Frye, both of 7136 Deerwood Rd. N.W., Roanoke, Va. 24019

Filed May 8, 1979, Ser. No. 37,112

Int. Cl.³ B05B *1/30*

U.S. Cl. 137—624.22 **11 Claims**



1. A shower valve assembly including a housing defining a water flow passage therethrough including inlet and outlet ends for communication with a water supply pipe and a shower head, a valve member supported from said housing for shifting between open and closed positions opening and closing said passage intermediate its opposite ends, said assembly including first and second latch means operative to releasably latch said valve member in said open and closed positions, respectively, water flow driven motor means operatively associated with said flow passage downstream from said valve member for releasing said first latch responsive to a predetermined amount of water flow through said passage, means yieldingly biasing said valve member toward said closed position, an actuator for said valve assembly shiftable between on and off positions, said valve assembly including selectively operable timer means, said timer means being operatively associated with said second latch for releasing the latter after a predetermined time subsequent to initial actuation of said timer means.

4,230,156

SOLENOID-ACTUATED VALVE

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

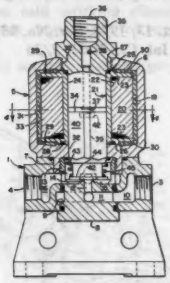
Filed Oct. 17, 1978, Ser. No. 952,091

Int. Cl.³ F16K *11/04, 31/02*

U.S. Cl. 137—625.5 **6 Claims**

1. A solenoid-actuated valve comprising a solenoid housing, a spool in said housing and having an axial bore, a plunger slidably reciprocable in and guided by said bore, a coil wound on said spool, and resin means in said housing and encapsulating said spool and coil, said resin means including inwardly flaring wedge means in said housing at opposite ends of said spool, and abutment means on and projecting beyond opposite ends of said spool and engaged by inner ends of said wedge

means, said wedge means acting against said housing and axially and laterally on said spool for wedging said spool and



therethrough said bore thereof against movement relative to said housing.

4,230,157

PIPE HAVING AN END PORTION, THE INNER WALL OF WHICH IS PROVIDED WITH A CIRCUMFERENTIAL GROOVE, IN WHICH A SEALING MEANS IS MOUNTED AND A PIPE JOINT CONSISTING OF THIS PIPE AND A SPIGOT END OF A SECOND PIPE INSERTED THEREIN

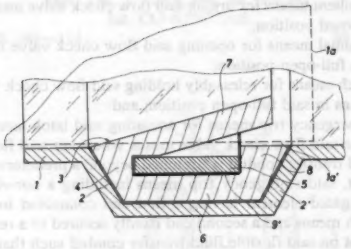
Christian Larsen, Gjern; Per D. Frederiksen, Skanderborg, and Ebbe N. Sorensen, Hojbjerg, all of Denmark, assignors to Wavin B.V., Zwolle, Netherlands

Filed Jan. 31, 1979, Ser. No. 8,035

Claims priority, application Denmark, Feb. 3, 1978, 502/78; Feb. 3, 1978, 503/78; Feb. 16, 1978, 705/78; Jun. 12, 1978, 2619/78; Jul. 14, 1978, 3173/78; Jan. 26, 1979, 347/79

Int. Cl.³ F16L *9/22*; F16J *15/32*; F16L *19/00*

U.S. Cl. 138—155 **19 Claims**



1. A pipe joint comprising bell and spigot pipes, the inner wall of said bell pipe **(1)** having a circumferential groove **(2)** defining a space in which a sealing means **(3)** is mounted said sealing means **(3)** comprising a sealing ring **(4)** preferably of rubber, having a substantially V-shaped cross-section when undeformed consisting of at least two lip portions **(6, 7)**, and a stiffening body **(5)** in cooperation with said sealing ring **(4)** for holding one of said lip portions in said groove **(2)**, characterized in that the sealing means **(3)** has portions **(6, 7, 52, 51, 51A, 51B, 51')** providing a compression seal between said pipes, the lengths of the lip portions **(6, 7)** of said sealing ring **(4)** being such that both lip portions, when seen from the mouth of the bell pipe end portion, extend further into the pipe than said stiffening body **(5)**, and in that the dimensions of said lip portions **(6, 7)** are such that there is more volume of lip material behind said stiffening body **(5)**, when viewed from the mouth of the bell pipe end, than there is room for in the space defined by the circumferential groove space confined by the adjacent part of the bottom **(2)** of the groove, the exterior of the spigot pipe **(1a)** to be inserted into the bell pipe **(1)** the rearmost sidewall **(2')** of the groove and the stiffening body **(5)**, so that the lip material in a state of compression and deformation substantially fills up said space.

4,230,158

CLEANING MEANS FOR A WEAVING MACHINE

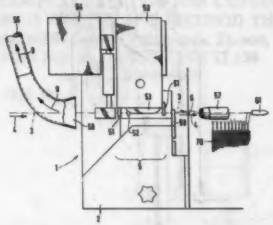
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Nov. 3, 1978, Ser. No. 957,088

Claims priority, application Switzerland, Nov. 7, 1977, 13504/77

Int. Cl.² D03J *1/04*

U.S. Cl. 139—1 C **7 Claims**



1. In combination with a weft picking mechanism of a weaving machine for picking a picking means in a predetermined picking direction into a shed formed in the weaving machine with a weft yarn trailing therefrom, said picking mechanism having a picking station wherein a weft yarn is engaged with the picking means, means for passing a stream of cleaning air over the weft yarn in said picking station in a direction opposite said predetermined picking direction and substantially parallel to the weft yarn to remove foreign matter from said picking mechanism.

4,230,159

HEDDLE FRAME

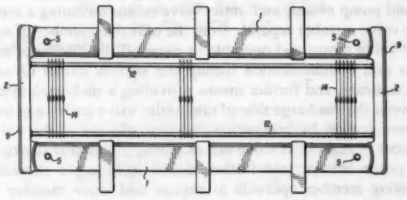
Yoichi Shimizu, Izumishi, Japan, assignor to Kabushiki Kaisha Maruyama Seisakusho, Sakaishi, Japan

Filed Dec. 20, 1978, Ser. No. 971,557

Claims priority, application Japan, Jun. 21, 1978, 53-84033[U]

Int. Cl.² D03C *9/06*

U.S. Cl. 139—91 **5 Claims**

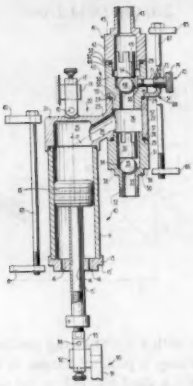


1. A heddle frame comprising a pair of projections elongated respectively from an upper portion of an inner side of a side stay and a lower portion of said inner side of said side stay, and respectively inserted into an inner hollow end portion of a lateral beam; a pin freely rotatingly connecting said lateral beam and said projection; the upper surface and the lower surface of said projection which respectively contacts the upper inner surface and the lower inner surface of said inner hollow end portion of said lateral beam being so made as to form a circular surface the center of which is on the axial horizontal center line of said pin.

4,230,160
ADJUSTABLE SUCK-BACK DEVICE FOR SANITARY PUMPS

Lawrence W. Buckley, Baltimore, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Dec. 11, 1978, Ser. No. 968,261
Int. Cl.[3] B65B 3/32; F04B 7/00
U.S. Cl. 141—116 19 Claims

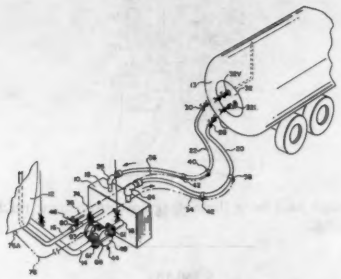


1. A filling unit for filling containers with a predetermined amount of a product, comprising pump means including cylinder means, piston means slidable within said cylinder means and defining a variable pump space whose volume depends on the position of the piston means during its suction and discharge stroke, inlet valve means adapted to be connected with a supply of the product to be dispensed, outlet valve means adapted to be connected at its discharge side with a discharge nozzle, means providing a communication between said inlet and outlet valve means and said pump space, said inlet valve means including a movable member operable to close off the inlet side from said communication during the discharge stroke of said pump means, said outlet valve means including a movable valve member separate from the movable member of said inlet valve means and operable to close off the discharge side from said communication during the suction stroke of said piston means, and further means providing a suck-back effect between the discharge side of said outlet valve means and said communication by preventing complete closure of the valve member of said outlet valve means during the suction stroke of the piston means, said further means including a threaded adjusting member operable to engage said valve member in such a way that complete closure is prevented, characterized in that the further means forms a sanitary suck-back device and includes a support member on said outlet valve means provided with a threaded bore disposed external of and spaced from said outlet valve means whose axis extends generally transversely to the opening and closing movements of the valve member of said outlet valve means, said threaded member having a threaded portion and an unthreaded portion, said threaded portion being in threaded engagement only with said threaded bore in the support member while said unthreaded portion extends into an unthreaded bore provided in the outlet valve means to facilitate cleaning of the various parts thereof.

4,230,161
THERMAL MANUAL EMERGENCY SHUT OFF VALVE

Evans R. Billington, Glenview; Robert J. Batka, and Christ P. Korbilas, both of Chicago, all of Ill., assignors to Rego Company, Chicago, Ill.

Filed Oct. 13, 1978, Ser. No. 951,165
Int. Cl.[3] B65B 3/26
U.S. Cl. 141—302 9 Claims



1. A fluid transfer system for directing the transfer of fluid between a stationary fluid supply tank and a mobile fluid delivery tank and for stopping the transfer of fluid between the stationary fluid supply tank and the mobile fluid delivery tank in response to a predetermined emergency condition, said fluid transfer system comprising:

(a) a rigid fluid transfer conduit connected to the stationary fluid supply tank;

(b) a flexible fluid transfer conduit formed from elastic material and serially connected between said rigid fluid transfer conduit and the mobile fluid delivery tank;

(c) flow check valve means mounted in said rigid fluid transfer conduit to close off the flow of fluid therethrough;

(d) resilient means for urging said flow check valve means to a closed position;

(e) manual means for opening said flow check valve means to a full-open position;

(f) latch means for releasably holding said flow check valve means in said full-open position; and

(g) emergency trip means for actuating said latch means to close said flow check valve means whenever said flexible fluid transfer conduit is stretched beyond a predetermined limit, said emergency trip means including a non-elastic elongated element having a first end connected to said latch means and a second end fixedly secured to a remote point on said flexible fluid transfer conduit such that said latch means is released by said non-elastic elongated element to close said flow check valve means whenever the distance between said latch means and said remote point is increased beyond a predetermined amount as a result of the stretching of said flexible fluid transfer conduit beyond said predetermined limit.

4,230,162
WOOD WORKING MACHINE

Robert M. Miller, Denver, Colo., assignor to Denver Wood Products Company, Denver, Colo.

Filed Dec. 28, 1978, Ser. No. 973,941
Int. Cl.[3] B27C 9/04
U.S. Cl. 144—3 R 5 Claims

1. A machine for sequentially performing work operations on opposite sides of a work piece, said machine comprising:

a vertically moveable work piece support;

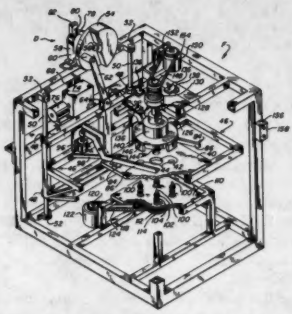
a clamping means on the work piece support for holding a work piece in position thereon;

first wood working elements mounted below said support;

second wood working elements mounted above said support;

drive means to reciprocatingly move said support from a rest position between said first and second elements up and down between said working elements for performing work operations sequentially on opposite sides of said work piece;

a first solenoid to activate said clamping means; and



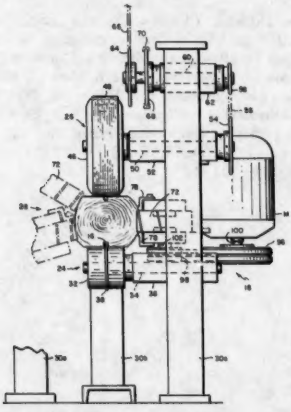
a switch means connected to the drive means to deactivate the clamping means after movement of said work piece support from said rest position to a lower position for working by said first wood working elements, back through said rest position to an upper position for working by said second wood working elements and back to said rest position, and to release the clamping means.

4,230,163

LOG-PLANING MACHINE

Edwin A. Barton, Colchester, Conn., assignor to Vermont Log Building, Inc., Hartland, Vt.

Filed Feb. 27, 1978, Ser. No. 881,361
Int. Cl.³ B27C *1/08*
U.S. Cl. 144—116 **39 Claims**



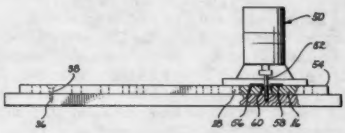
1. The method of planing logs comprising supporting, guiding and moving a log along a predetermined rectilinear path in a substantially horizontal plane, supporting at least two cutters adjacent the path of movement of the log at different peripheral positions about the log and at longitudinally-spaced positions along the path of travel with one of the cutters preceding the other for rotation about their centers and arcuate movement toward and from the side of the log, moving the cutters arcuately into engagement with the side of the log, yieldably supporting the cutters in engagement with the side of the log and, at said position of engagement, moving the one cutter transversely with respect to the path of movement of the log according to a predetermined pattern to form a cut of predetermined contour and depth and employing a pattern generated by the one cutter to effect movement of the other cutter transversely with respect to the path of movement of the log to reproduce the contour of the first cut at a different peripheral position on the surface of the log.

4,230,164

NESTED TEMPLATE SYSTEM FOR CUTTING ONE PIECE CLOSED FRAMES AND METHOD THEREFOR

John E. Mericle, 10528 Camino Palo Verde, Tucson, Ariz. 85715

Filed Feb. 12, 1979, Ser. No. 11,139
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—134 D **13 Claims**



1. Apparatus for defining cuts to be made to obtain one piece frames from sheet material, said apparatus comprising in combination:

(a) a plurality of concentric templates, each said template locating the interior and exterior perimeters and width of a one piece frame; and

(b) means for securing each said template to the sheet material concentric with an adjacent one of said templates and spaced apart therefrom;

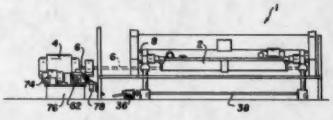
whereby, said adjacent spaced apart templates define continuous bands of sheet material to be cut to obtain the one piece frames.

4,230,165

HYDROSTATIC DRIVE FOR LATHES

John E. Berryman, and John W. Metzner, both of Vancouver, Canada, assignors to P.S.I. Fluid Power Ltd., Vancouver, Canada

Filed Apr. 2, 1979, Ser. No. 26,324
Int. Cl.³ B27L *5/02*
U.S. Cl. 144—209 R **11 Claims**



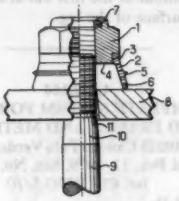
1. A veneer lathe for peeling a log, comprising: a knife carriage; a mechanism for moving the carriage towards and away from the log; an electric motor for moving the carriage towards the log at a rate of speed related to the rotational speed of the log so as to peel a required thickness of veneer; a clutch for coupling the electric motor to the mechanism or disengaging the electric motor from the mechanism; a hydraulic motor connected to the mechanism for rapidly advancing the carriage towards the log or retracting the carriage from the log; and a by-pass valve which permits free rotation of the hydraulic motor when the clutch is engaged.

4,230,166

SKIRTED NUT

Jacques Layeillon, Paris, France, assignor to Simmonds, S.A., France

Filed Oct. 23, 1978, Ser. No. 953,578
Claims priority, application France, Dec. 14, 1977, 77 37693
Int. Cl.[2] F16B *39/26, 39/34*
U.S. Cl. 151—7 **3 Claims**



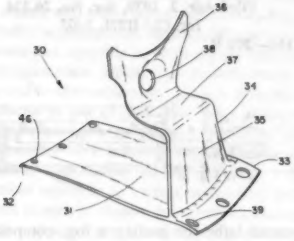
1. In a skirted nut comprising a nut portion having a bearing face adapted to be applied onto the face of a member or part and a resilient skirt portion, the latter being substantially frusto-conical in shape and having a smaller base end region secured to the bearing face side of the nut portion and a larger base end region adapted to be applied onto the face of the member or part onto which the bearing face of the nut portion is adapted to be applied, the improvement comprising said skirt portion being formed by a wall having a substantially constant thickness throughout its height and including a rib integrally formed on the external surface of said skirt portion wall circularly extending around the entire periphery of said frusto-conical skirt portion at substantially the mid-portion of the height thereof, so as to be substantially within a plane which is perpendicular to the center axis of the frusto-conical skirt portion, said rib being substantially triangular in cross-section, whereby said skirt portion is prevented from turning upwardly and assuming a upwardly turned configuration during the threading of said nut portion as the bearing face of the nut portion moves toward the face of the member or part.

4,230,167

SNOW CHAIN BRACKET FOR VEHICLE WHEEL

Earl D. Carver, 740 Alexander St., Greenwood, Ind. 46142

Filed Jan. 29, 1979, Ser. No. 7,364
Int. Cl.[3] B60C *27/00*
U.S. Cl. 152—233 **10 Claims**



1. A bracket for mounting snow chains to a vehicle wheel having a rim and attached spider comprising:

a first wall with opposite end portions and extendable through said wheel between said rim and spider to position said end portions on opposite sides of said wheel;

fastening means including fasteners on said opposite end portions operable to releasably engage and hold a snow chain extending radially around said wheel; and

a second wall having a proximal end portion, an intermediate portion, and a distal end portion with said proximal end portion connected to said first wall adjacent one of said end portions, said second wall extends at said proximal end portion of said first wall toward said distal end portion which is joined thereto by said intermediate portion, said distal end portion includes a lug bolt hole and a pair of lug-engaging corner portions with stop surfaces to cooperatively limit relative motion of said second wall relative to the wheel.

4,230,168

POLYURETHANE TIRE FILLING MATERIAL WITH PLASTICIZER INCORPORATED THEREIN

Hiroshi Kaneda, Murayama; Yoji Watabe, Akikawa; Akio Souma, Murayama; Yasuyuki Ura; Michio Ishii, both of Kodaira, and Shiro Anzai, Murayama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1978, Ser. No. 955,503
Claims priority, application Japan, Nov. 7, 1977, 52/132587
Int. Cl.[3] B60C *17/00, 1/00;* **C08K** *5/02, 5/10*
U.S. Cl. 152—310 **6 Claims**

1. A tire filled with elastomeric material having high resilience, the material being produced by curing a mixture of

(a) a polyoxypropylene polyol having an OH equivalent molecular weight of 900–1,800 and a functionality of 2–4,

(b) a polyisocyanate, and

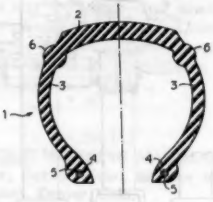
(c) a chlorinated paraffin or dialkyl phthalate plasticizer miscible with the polyoxypropylene polyol in the presence of a catalyst where the equivalent ratio (NCO/OH) of isocyanate groups in the component (b) to hydroxyl groups in the component (a) is from 0.8–2.0 and the amount of the component (c) is 10–200 parts by weight per 100 parts by weight of the component (a).

4,230,169

NONREINFORCED TIRE HAVING STRENGTHENED ZONES

Jacques Boileau, Clermont-Ferrand, and Albert Mathevet, Chamalieres, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 796,176, May 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 693,969, Jun. 7, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,546
Claims priority, application France, Jun. 12, 1975, 75 18483
Int. Cl.[3] B60C *9/00, 13/00*
U.S. Cl. 152—353 R **5 Claims**



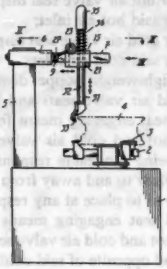
1. A tire of elastic material having a tread extended on both sides by a shoulder and a sidewall terminating in a bead, said tire being without reinforcement in the tread and in the sidewalls, characterized by the fact that between each shoulder and the corresponding sidewall the tire has a zone whose rigidity in the circumferential direction is higher than the rigidity of the adjacent shoulder and the adjacent sidewall, said zone comprising an annular bulge.

4,230,170

APPARATUS FOR FITTING AND REMOVING AN AUTOMOBILE TIRE

Victor Duquesne, Quellinstraat 42, 2000 Antwerpen, Belgium

Filed Apr. 7, 1977, Ser. No. 785,478
Claims priority, application Belgium, Mar. 14, 1977, 255731
Int. Cl.³ B60C *25/06*
U.S. Cl. 157—1.24 **9 Claims**



1. Apparatus, for fitting and removing an automobile tire, comprising:

(i) a frame

(ii) a table rotatably mounted on said frame and including jaws radially movable for gripping a wheel

(iii) means for rotating said table

(iv) means for radially moving said jaws

(v) a column extending vertically from said frame

(vi) a horizontal arm carried by said column and movable horizontally along its own longitudinal axis with respect to said column,

(vii) a carriage movable along the arm

(viii) a vertical bar carried by and vertically adjustable with respect to said carriage, said bar being provided with a tool for fitting and removal of a tire, and

(ix) fixing means acting between the carriage and the arm, and between the vertical bar and the carriage, for simultaneously locking the carriage to the arm and locking the vertical bar to the carriage such that the tool becomes disposed, in two directions, at a predetermined distance from a wheel on said table, said fixing means comprising first and second relatively movable blocks included in said carriage and disposed one at each side of the arm and each defining a longitudinal guide for the arm, the guide defined by one said block being formed to provide a clearance in height of the block with respect to the arm, said one block having a vertical opening receiving the bar in contact with the arm, a shaft connecting the two blocks, and actuating means which serve to simultaneously draw the two blocks together to press the bar against the arm, and to raise said one block with respect to the other block for locking said one block to the arm with the bar in a predetermined position with respect to the arm.

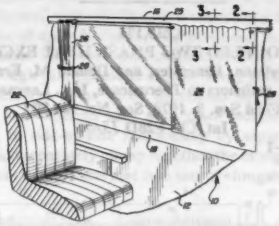
4,230,171

DRAPERY PLEATING APPARATUS AND METHOD

George H. Baker, Sr., R.R. #1, Dunlap, Ill. 61525

Filed Feb. 28, 1979, Ser. No. 16,282
Int. Cl.³ A47H *5/00*; E06B *3/94*
U.S. Cl. 160—84 R **20 Claims**

1. A drapery made of a sheet of material, a backing strip, a plurality of stiffening members attached to said backing strip in spaced apart relationship, a fastener extending from some of said stiffening members, said backing strip and plural stiffening members being secured to said sheet of material near at least the upper edge portion thereof with said fasteners projecting



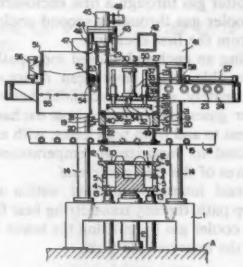
rearwardly therefrom, and brake means attached to at least one stiffening member.

4,230,172

MOLDING APPARATUS WITH A COMPRESSED AIR SQUEEZE PLATE

Nagato Uzaki, Toyokawa; Yasutaro Kawamura, Okazaki; Kimikazu Kaneto, Toyokawa, and Masaharu Hasizume, Chiryu, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Jul. 26, 1979, Ser. No. 60,861
Claims priority, application Japan, Mar. 8, 1979, 54-27561
Int. Cl.³ B22C *15/28*
U.S. Cl. 164—192 **10 Claims**



1. A molding apparatus comprising:

a pattern plate provided at desired portions thereof with vent bores;

means for moving a mold flask to a position just above said pattern plate;

an up-set frame disposed at a position above said mold flask just above said pattern plate, said upset frame being movable up and down;

a box-shaped cover member having a lower end opening and arranged to displaceably cover the upper opening of said up-set frame;

means for lifting and lowering said pattern plate up and down relatively to said cover member so that said up-set frame and said mold flask brought to said position may be cramped between said cover member and said pattern plate;

an imperforate squeeze plate disposed in said cover member and movable up into and down and out of said cover member through said lower opening thereof, whereby said squeeze plate may be moved down into and up out of said upset frame; and

means for supplying a compressed air into the cramped mold flask through said lower end opening of said cover member and through said up-set frame when said squeeze plate has been retracted into said cover member, said means also adapted for supplying a compressed air onto said

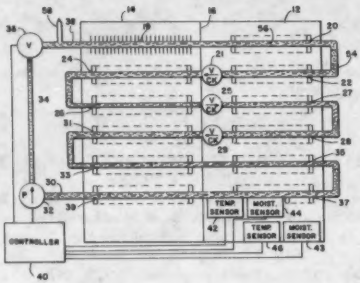
squeeze plate to impart a squeezing power to said squeeze plate when said squeeze plate has been moved down into said up-set frame.

4,230,173

CLOSELY COUPLED TWO PHASE HEAT EXCHANGER

George Y. Eastman, Lancaster, and Donald M. Ernst, Leola, both of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Sep. 5, 1978, Ser. No. 939,802
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—1 **13 Claims**



1. A method of exchanging heat between two gases comprising:

moving a hotter gas through a first enclosure;

moving a cooler gas through a second enclosure which is isolated from the first enclosure;

partially filling an enclosed, closed loop path, from which non-condensible gases have been removed and which passes alternately, at least two times, between the hotter and cooler gases and includes heat exchanger means to transfer heat to and from both gases, with an intermediate fluid selected to vaporize at temperatures between the temperatures of the two gases; and

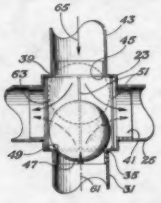
circulating said intermediate fluid within said enclosed, closed loop path, thereby transferring heat from the hotter gas to the cooler gas by utilizing the latent heat of vaporization of the intermediate fluid.

4,230,174

DAMPER ASSEMBLY

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Continuation of Ser. No. 778,740, Mar. 17, 1977, abandoned.
This application Oct. 20, 1978, Ser. No. 953,266
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—27 **5 Claims**



1. In a heating and cooling system for a mobile home and the like, including a system of air ducts extending about the mobile home and communicating with the mobile home interior, a heating unit in the mobile home and including a hot air exhaust, a cooling unit in the mobile home and including a cold air exhaust; the improvement comprising:

a. a plenum chamber including:

i. a hot air inlet aperture in a first wall portion and connected in communication with said hot air exhaust of said heating unit;

ii. a cold air inlet aperture in a second wall portion opposite the said first wall portion and connected in communication with said cold air exhaust of said cooling unit; and

iii. outlet openings in side wall portions and connected in communication with the system of air ducts;

b. a smooth circular hot air valve seat disposed in fluid tight relationship with said hot air inlet;

c. a smooth circular cold air valve seat disposed in fluid tight relationship with said cold air inlet;

d. a large hollow, lightweight poppet disposed intermediate said hot and cold air valve seats and having respective smooth circular seat engaging means for sealingly fitting respective said hot and cold air valve seats, said large hollow poppet being moveable responsive to respective directions of air flow to and away from said hot and cold air valve seats so as to place at any respective flow of air only one of said seat engaging means sealingly against only one of said hot and cold air valve seats to permit flow from the other and opposite of said cold and hot air valve seats and to block reverse flow through said one of said hot and cold air valve seats; and

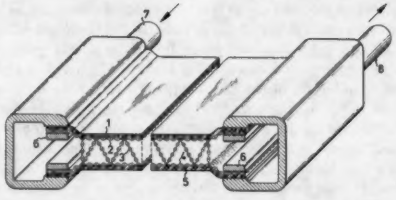
e. guide means for freely guiding said hollow poppet between said hot and cold air seats for insuring properly and sealing seating of the respective seats and seat engaging means.

4,230,175

HEAT EXCHANGER ELEMENT

Dieter Disselbeck, Bad Soden am Taunus; Eduard Hilscher, Idstein, and Klaus Speier, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,285
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 27044543; Apr. 2, 1977, 27149015
Int. Cl.³ F28F *3/12*
U.S. Cl. 165—46 **7 Claims**



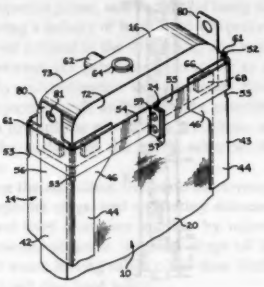
1. A heat exchanger element comprising a flexible face fabric coated on one side with an impervious material, a flexible back fabric coated on one side with a liquid impervious material spaced from said face fabric with the uncoated sides thereof facing each other; a binder of flexible material positioned between and secured to the uncoated sides of said face and back fabrics; said face and back fabrics being formed of textile fabrics and said binder material being formed of binder filaments positioned between and secured to the uncoated sides of said textile fabrics to maintain said textile fabrics in spaced relation to each other; a feeder duct and a discharge duct for heat exchange medium communicating with the space between said face and back fabrics whereby said heat exchange medium is adapted to flow between said coated fabrics between said binder filaments.

4,230,176

FLOATING RADIATOR TANK TOP

Donald R. Crews, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 24, 1978, Ser. No. 899,769
Int. Cl.[3] F28F 9/00; F28D 1/00
U.S. Cl. 165—67 8 Claims



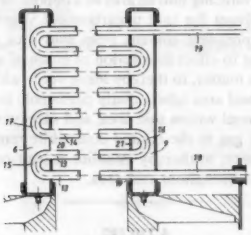
1. A unit core radiator having a bottom tank, a top tank, and a heat exchange core extending between said bottom tank and said top tank, a support on which said bottom tank is carried, side channel supports attached to said support and extending upwardly adjacent said heat exchange core and projecting in overlapping relationship to said top tank, low friction means carried by said top tank in contact with said overlapping side support for supporting said top tank relative to said side channel supports, means encircling said side channel supports and said top tank and means on said encircling means for tightening said encircling means to urge said side supports into frictional engagement with said low friction means on said top tank whereby passing heated fluid through said radiator expands said heat exchange core to force the top tank and the low friction means on the top tank to move longitudinally relative to the side support.

4,230,177

HEAT EXCHANGE WITH SEPARATELY SUPPORTED AND SEPARATELY REMOVABLE TUBULAR COILS

Karl-Erik Berkestad, Linköping, Sweden, assignor to Stal-Laval Apparat AB, Sweden

Filed Nov. 13, 1978, Ser. No. 960,242
Claims priority, application Sweden, Nov. 16, 1977, 7712575
Int. Cl.[3] F28F 9/00
U.S. Cl. 165—67 15 Claims



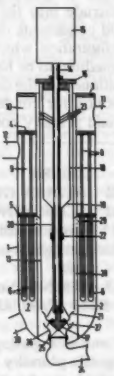
1. A component heat exchanger which can be easily disassembled and reassembled to replace defective portions thereof, said heat exchanger comprising a multiplicity of individual sections positioned in side-by-side relationship, each individual section including two spaced apart elongated supporting members and a tubular coil supported therebetween, the side-by-side positioned individual sections thus forming two spaced apart sets of side-by-side positioned elongated supporting members, each said elongated supporting member including a wall facing the corresponding supporting member of the individual section, said facing wall of each supporting member including spaced apart openings positioned in the longitudinal direction thereof, said tubular coil comprising a multiplicity of vertical spaced apart horizontal segments and interconnecting bent segments, said horizontal segments being positioned to extend through said openings in said facing walls of said supporting members so as to be supported by said supporting members, and wherein said individual sections are fixedly positioned in side-by-side relationship by separate clamping means which separately clamp together the elongated supporting members which form said two sets of elongated supporting members.

4,230,178

HEAT EXCHANGER WITH PUMP

Antonius M. M. Braat, Roosendaal, and Harry Lagerwerf, Rotterdam, both of Netherlands, assignors to B. V. Neratoom, Netherlands

Filed May 16, 1979, Ser. No. 39,363
Claims priority, application Netherlands, May 19, 1978, 7805467
Int. Cl.[3] F28D 7/12; F28F 13/12
U.S. Cl. 165—76 5 Claims



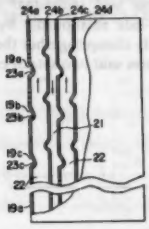
1. A heat exchanger, comprising a casing, a cylindrical inner jacket arranged centrally in said casing, an assembly of tubes of the bayonet type arranged as an annular bank around the cylindrical jacket in said casing, a supply opening for a first medium in the wall of said casing, a discharge opening for said first medium in the wall of said casing, means for conducting the first medium through said tubes from said supply opening to said discharge opening, a supply opening for a second medium in the wall of the casing, a discharge opening for said second medium in the wall of the casing, a pump impeller arranged centrally at the bottom of said casing for conducting said second medium from said supply opening thereof around said tubes to said discharge opening thereof, a pump shaft connected to said impeller and projecting upwardly inside said cylindrical inner jacket, and a motor disposed in situ for driving said pump shaft above said casing.

4,230,179

PLATE TYPE CONDENSERS

Haruo Uehara, Saga, and Michizo Miyoshi, Yokohama, both of Japan, assignors to Haruo Uehara and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 809,766, Jun. 24, 1977, abandoned.
This application Jul. 9, 1979, Ser. No. 55,779
Int. Cl.³ F28B *9/08*
U.S. Cl. 165—113 **6 Claims**



1. In a plate type condenser of the type wherein a plurality of spaced metal plates are arranged to define a plurality of passages therebetween and heated medium to be condensed and medium to be heated thereby are passed through said passages in the opposite directions, the improvement which comprises a primary condensation section including a plurality of condensation elements and a plurality of condensate discharge grooves formed in said metal plate and extending along respective condensation elements and inclined with respect to said passages, said condensate discharge grooves being spaced from each other in the direction of flow of said heated medium and said medium to be heated by flat portions of said metal plates which do not protrude into the passage passing said medium to be heated, said condensate discharge grooves having a cross-sectional configuration which only protrudes into the passage passing said medium to be heated, and a secondary condensation section positioned on the downstream side of said primary condensation section for condensing the heated medium not condensed by said primary condensation section.

4,230,180

ISOLATING PACKER UNITS IN GEOLOGICAL AND GEOPHYSICAL MEASURING CASINGS

Franklin D. Patton, West Vancouver, and James D. McFarlane, Vancouver, both of Canada, assignors to Westbay Instruments Ltd., West Vancouver, Canada

Filed Nov. 13, 1978, Ser. No. 959,843
Int. Cl.² E21B *47/00, 33/124*
U.S. Cl. 166—185 **11 Claims**

1. An isolating packer unit in a geological and geophysical measuring casing made up of a plurality of said units at different levels and through which can be moved instruments for taking measurements and samples in wells or bore holes at said different levels, each isolating packer unit comprising:

axially aligned and spaced measuring casings,

a coupler tube connected at opposite ends to ends of the casings to interconnect the casings, said casings and tube forming a common passageway through which an instrument can be moved to take measurements and samples,

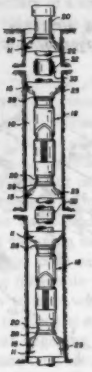
a measuring port in the coupler tube permitting communication between the interior and exterior thereof,

a valve normally closing the measuring port and operable from within the tube by said instrument to open said port,

an elongate elastic packer tube mounted on and concentric with each casing, said each casing extending through its packer tube and beyond the ends thereof,

securing means fastening the ends of each packer tube to the casing extending through the latter packing tube, and

means for directing fluid from the top of the wall or bore hole in which the packer unit is located into both of said packer tubes to expand the packer tubes to engage the wall of said well or bore hole to isolate the measuring port of the coupler tube from the portions of the well or bore hole above and below the packer units.

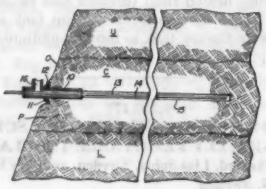


4,230,181

IN SITU METHOD OF PROCESSING BITUMINOUS COAL

James R. Pennington, 1127 Oak Hills Way, Salt Lake City, Utah 84108

Filed Aug. 31, 1978, Ser. No. 938,420
Int. Cl.² E21B *43/24, 43/25*
U.S. Cl. 166—259 **10 Claims**



1. A method for the in situ processing of deposits of bituminous coal having inclusions of uncarbonized vegetable matter randomly distributed throughout to recover values therefrom, comprising introducing into an area of a deposit of such bituminous coal a solvent for said uncarbonized vegetable matter; removing the pregnant solvent from said area after a time period sufficient to effect dissolution of much of said uncarbonized vegetable matter, to thereby leave voids within said area and to render said area substantially permeable to combustion gases; igniting coal within said area; and supplying a combustion-supporting gas to the ignited coal while removing products of combustion, to thereby establish at least one heat front which migrates throughout said area.

4,230,182

OIL RECOVERY METHOD EMPLOYING ALTERNATE SLUGS OF SURFACTANT FLUID AND FRESH WATER

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 30, 1979, Ser. No. 71,220
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **32 Claims**

1. A method of recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by at

least one injection well and by at least one production well, said formation containing water having a salinity in excess of about 20,000 parts per million total dissolved solids, including known or determinable divalent ion concentration, comprising injection into the formation a predetermined volume of surfactant fluid, said surfactant fluid comprising a continuous aqueous phase containing at least one surfactant and a discontinuous, non aqueous phase, said surfactant being slightly soluble in a fluid having a salinity of from 50 to 100 percent of the salinity of the water present in the formation, and reducing interfacial tension between the petroleum and water to a value less than 100 millidynes/centimeter, said surfactant fluid being injected via the injection well and displacing petroleum through the formation toward the production well from which it is recovered to the surface of the earth, wherein the improvement comprises:

injecting the surfactant fluid into the formation in from 2 to 15 separate slugs, and separating successive slugs of surfactant fluid from one another by injecting sequentially therewith, separate isolation slugs of fluid comprising fresh water having salinity less than 10,000 parts per million total dissolved solids.

4,230,183

METHOD FOR TREATING SUBTERRANEAN, CLAY-CONTAINING EARTH FORMATIONS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,314
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **14 Claims**

1. A method for treating a subterranean earth formation containing water-sensitive clays, to render the formation less sensitive to loss of permeability due to contact with fresh water, comprising:

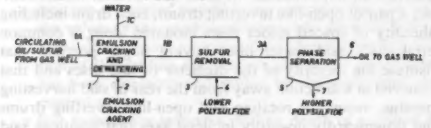
contacting said earth formation with an effective amount of an aqueous fluid containing a chelated polyvalent transition metal ion, said metal being selected from the group consisting of cobalt, nickel, iron, chromium and copper, and comprising an organic chelating ligand selected from the group consisting of ethylenediamine, propylenediamine, α,α'-dipyridyl, and o-phenanthroline.

4,230,184

SULFUR EXTRACTION METHOD

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 1, 1978, Ser. No. 965,659
Int. Cl.[2] C10G *19/00, 29/08;* E21B *21/00*
U.S. Cl. 166—312 **16 Claims**



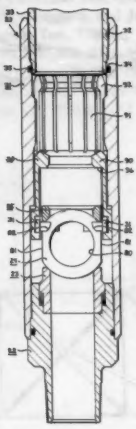
1. A process for extracting sulfur from a mineral oil-sulfur solution wherein the mineral oil is at least partly in the form of an emulsion with a minor quantity of water comprising treating said solution by adding an oil/water emulsion-breaking surfactant thereto, contacting the treated solution with an aqueous solution of a lower polysulfide of an alkali metal or ammonia to form a higher polysulfide of said alkali metal or ammonia, and separating the mineral oil from the higher polysulfide.

4,230,185

ROD OPERATED ROTARY WELL VALVE

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 31, 1978, Ser. No. 911,186
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—332 **3 Claims**



1. A well valve comprising: a valve body having a longitudinal bore defining a flow passage therethrough including a reduced bore portion defining a locking surface and an annular tapered cam surface leading to said locking surface; a lower annular valve seat supported in said body around said flow passage spaced from said locking surface; an upper valve seat supported in said valve body around said flow passage spaced between said lower valve seat and said locking surface; a ball valve having a flow passage therethrough supported for rotation between open and closed positions about a longitudinally fixed transverse axis between said lower and upper valve seats; and a longitudinally movable valve operator in said body coupled with said ball valve for rotating said ball valve between open and closed positions responsive to longitudinal movement of said valve operator, said valve operator having a plurality of circumferentially spaced laterally flexible upwardly extending collet fingers each provided with external and internal bosses spaced from said ball valve to position said external bosses within said locking surface of said valve body bore for holding said collet fingers compressed inwardly when said ball valve is at said open position and said inner bosses on said fingers projecting inwardly to fit around an enlarged end portion of an operating probe whereby said valve is moved to said open position by insertion of said operating probe into said collet fingers and said valve is returned to said closed position upon removal of said operating probe from said collet fingers.

4,230,186

SIMPLIFIED SUBSEA PRODUCTION WELLHEAD

Harry R. Lewis, Jr., Aberdeen, Scotland, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 968,236
Int. Cl.[3] E21B *7/12*
U.S. Cl. 166—342 **6 Claims**

1. A production wellhead means for use with a subsea well which comprises:

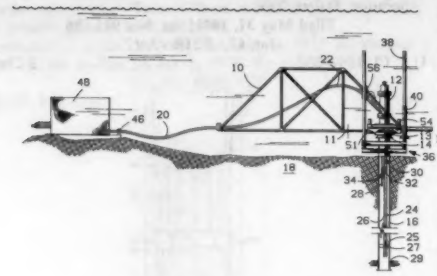
a frame structure,

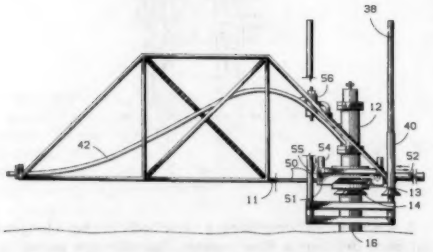
a sub structure;

a diverter spool for attaching to a subsea well and having a longitudinal axis and attached to said sub structure;

support means for supporting said sub structure from said frame structure, said support means including means for

moving the said diverter spool in a direction along its longitudinal axis with respect to said frame structure and





means for moving said diverter spool with respect to said frame structure in a direction substantially perpendicular to said axis of said diverter spool.

4,230,187

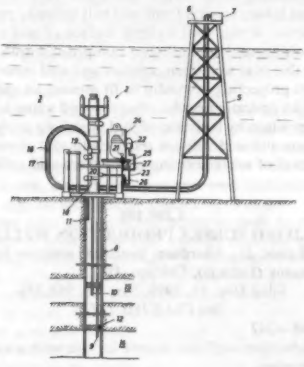
METHODS AND APPARATUS FOR SENSING WELLHEAD PRESSURE

Rodney K. M. Seto, Missouri City; Eugene L. Brickman, and Michael R. Fitzgibbons, both of Houston, all of Tex., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 19, 1979, Ser. No. 50,072

Int. Cl.[3] E21B *43/01*; F15B *20/00*; F16K *17/36*

U.S. Cl. 166—362 **39 Claims**



1. A method of monitoring and controlling a primary pressure in a subsea system containing a primary fluid, comprising

establishing a secondary fluid isolated from said primary fluid by a yeildable barrier therebetween,

establishing and maintaining an initial pressure on said secondary fluid substantially reducing the further compressibility of said secondary fluid,

thereafter applying said primary pressure to said yeildable barrier for increasing the pressure on said secondary fluid in a manner functionally related to said primary pressure,

deriving an indication of the pressure on said secondary fluid as a function of said primary pressure in said system, and

controlling said primary pressure in response to said indication of the pressure on said secondary fluid.

28. In a petroleum installation and the like, apparatus for monitoring a primary pressure on a petroluem fluid comprising

a module including control circuitry immersed in a protective fluid,

pressure transducer means within said module for generating a signal in response to a secondary fluid pressure,

conduit means interconnected with said transducer means for containing a secondary fluid,

isolator means interconnected with said installation and said conduit means and having piston means slidably separating said petroleum fluids and said secondary fluid and subjecting said secondary fluid to a secondary pressure functionally related to said wellhead pressure, and

shutoff means within said isolator means for automatically retaining said petroleum fluid within said installation in the event of a leak in said conduit means.

4,230,188

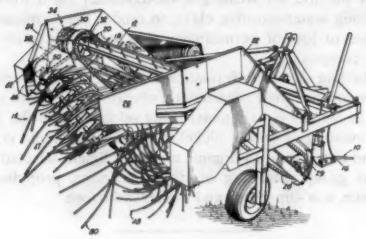
PEANUT DIGGER-SHAKER-INVERTER

John R. Paulk, Fitzgerald, Ga., assignor to Paulk Manufacturing Co., Inc., Fitzgerald, Ga.

Filed Sep. 17, 1976, Ser. No. 724,306

Int. Cl.[3] A01D *29/00*

U.S. Cl. 171—101 **6 Claims**



1. In a root crop harvesting apparatus having digging means for digging root crop plants from their growing implantation in the ground, shaker-conveyor means receiving said plants for shaking them to remove debris while conveying them to elevated discharge disposition, and inverter means intercepting the discharged plants from the shaker-conveyor means for directing them in inverted position in a windrow behind the apparatus, the improvement wherein said inverter means comprises a pair of open-like inverting drums, each drum including a plurality of spaced spider discs mounted along a common central shaft, said spider discs having finger portions that constitute the majority of the diameter of said discs and that are curved in a direction away from the rear of said harvesting apparatus, means for rotating said open-like inverting drums about downwardly inwardly inclined axes that positions said spider discs at an angle that is substantially displaced from the horizontal plane of the ground, and a set of inverting tines operatively associated with each of said open-like inverting drums and positioned below the distal end of said finger portion to support the plants as they pass over and are gently agitated and bumped by the fingers of said discs while being positively urged along the inverting tines, said fingers of each of said inverting drums operatively extending along substantially half the length of its associated set of tines thereby exerting positive control on the moving plants after being dis-

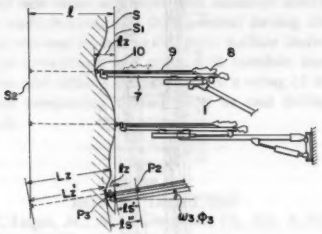
charged onto the inverting means and subjecting said plants to an additional cleaning action during the inversion state so that the loosened soil falls freely between said spaced spider discs and through the inverting drums and not onto the inverted vines which have been deposited on the ground.

4,230,189

DRILLED HOLE END ADJUSTING ARRANGEMENT

Toru Mashimo, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Aki, Japan

Filed Jun. 7, 1978, Ser. No. 914,747
Claims priority, application Japan, Jun. 7, 1977, 52-66998
Int. Cl.[2] B23Q 5/00; E21C 5/00
U.S. Cl. 173—4 **3 Claims**



1. A drilled hole end adjusting arrangement for a drilling machine or the like which comprises;

a boom structure on which the drilling machine is operably mounted;

a memory unit for storing values of the position of the drilling machine at plurality of drilling points on a drilling plane immediately in front of a drill-working face and which are in a rectangular coordinate system;

a converter unit connected to said memory unit for converting the values for a drilling point supplied from said memory means into values of working distance and working direction angle of the boom struction in a boom coordinate system;

a positioning servo control unit connected to said converter unit and said boom structure for displacing said boom structure according to said values for the drilling point supplied from said converter unit for bringing the drilling machine to the drilling point of the drilling plane and also for displacing said boom structure so as to shift the drilling machine from said drilling point on the drilling plane into actual contact with the drill-working face at an actual drilling point;

a drilling machine control unit connected to said positioning servo control unit and said drilling machine for starting the drilling operation of the drilling machine upon receipt of a signal indicating that positioning of the drilling machine by the positioning servo control unit is completed;

a detector connected to said boom structure for calculating the values of the working distance and working direction angle of the boom structure from the position and direction of the drilling machine on said boom means after it has been displaced and shifted by the positioning servo control unit;

a first register for storing a drilling depth of a drilled hole from said drilling plane to a plane parallel with said drilling plane;

a first arithmetic unit connected to said first register and said converter unit for calculating the drilling depth at the direction angle of the boom structure positioned at the drilling point of the drilling plane; and

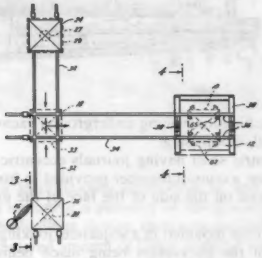
a second arithmetic unit connected to said first arithmetic unit and said detector for calculating the actual drilling depth from drilling depth supplied from said first arithmetic unit and the working values supplied from said arithmetic unit, and also connected to said drilling machine control unit for supplying said actual drilling depth to said drilling machine control unit for controlling the drilling operation of the drilling machine.

4,230,190

BLOW OUT PREVENTER HANDLING SYSTEM

David C. Guinn; Archie K. Haggard, and John P. Thomas, all of P.O. Box 1126, Houston, Tex. 77001

Continuation of Ser. No. 840,944, Oct. 11, 1977, abandoned, which is a division of Ser. No. 729,494, Oct. 4, 1976, Pat. No. 4,081,163. This application Oct. 13, 1978, Ser. No. 952,031
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—5 **14 Claims**



1. A system for testing and installing a blow out preventer on a floating vessel having a moon pool and a derrick over the moon pool, the derrick having an opening through which a portion of the blow out preventer can be moved and having means for lowering it into the moon pool comprising,

retractable rotary table support beams disposed over the moon pool supporting a rotary table for rotating a drill string during rotary drilling operations,

means releasably connecting the rotary table to the rotary table support beams,

retractable substructure beams below the rotary table,

test stump means

means for positioning an upper section and a lower section of the blow out preventer on opposite sides of the longitudinal axis of the vessel, for placing the lower section of the blow out preventer on the test stump means and placing the upper section on the lower section,

support shoulders extending from at least one of the upper and lower sections arranged to support the blow out preventer on the substructure beams,

means operable to move the assembled blow out preventer through the derrick opening and space provided by the retracted substructure beams and over the moon pool,

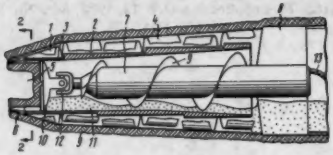
guide means operable to restrain swinging movement of the blow out preventer when moving it in the moon pool,

whereby the upper section and the lower section of the blow out preventer can be positioned on opposite sides of the longitudinal axis of the vessel thereby minimizing forces due to the roll of the vessel, the upper section can be placed on the lower section and the blow out preventer assembled and tested on the test stump means and then moved through the derrick opening and space provided by the retracted rotary table support beams and over the moon pool and guided while being lowered until the support shoulders engage the retractable substructure beams, the rotary table support beams replaced and the rotary table connected to them, the upper section of the blow out preventer connected to the means to lower it, the blow out preventer lifted and the substructure beams retracted, and the blow out preventer then lowered in the moon pool.

4,230,191
MACHINE FOR MAKING UNDERGROUND EXCAVATIONS

Valentin K. Svirschevsky, Krasny prospekt, 98, kv. 103; Andrei A. Trofimuk, Zolotodolinskaya ulitsa, 87; Gennady G. Vasiliev, ulitsa Novogodnaya 28, kv. 17, and Ivan P. Leonov, ulitsa Tikhvinskaya, 2, kv. 38, all of Novosibirsk, U.S.S.R.

Filed Jan. 24, 1979, Ser. No. 6,115
Int. Cl.[2] E21B *11/02, 1/06*
U.S. Cl. 175—20 6 Claims



1. A machine for making underground excavations by compacting soil, comprising:

an eccentric shaft having journals eccentric relative to one another; a conical member provided in front of the eccentric shaft on the side of the face of the excavation being made;

tapered rolls mounted in a sequence, looking away from the face of the excavation being made behind said conical member, on said journals of said eccentric shaft, said rolls defining, in combination with said conical member, a conically expanding body, the tapered rolls being mounted for free rotation about said eccentric shaft;

a drive for rotating said eccentric shaft and for longitudinally moving said machine within the excavation;

a through longitudinal diffuser passage in said conical member;

a through longitudinal diffuser passage in said eccentric shaft, the cross-sectional area of said passage of the eccentric shaft enlarging in the direction away from the face of the excavation being made, and the smallest cross-sectional area of said passage of the conical member being smaller than the smallest cross-sectional area of said passage of the eccentric shaft so that said inside cross-sectional area of said passage of the conical member, during operation of the machine, is substantially within said inside cross-sectional area of the eccentric shaft, and both passages defining in combination a through passage for the transfer of soil partially removed during operation of the machine.

4,230,192
CORE SAMPLING APPARATUS AND METHOD

Fritz T. Pfannkuche, 2205 Dunstan, Houston, Tex. 77005

Filed Aug. 8, 1978, Ser. No. 932,027
Int. Cl.[2] E21B *9/20*
U.S. Cl. 175—59 25 Claims

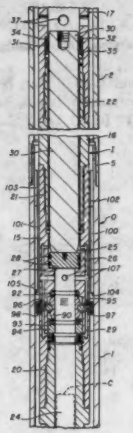
1. Coring apparatus for obtaining core samples from the bottom of a well bore comprising:

an outer barrel assembly the lower end of which is adapted for connection to a core bit, the upper end of which is adapted for connection to a drill string;

an inner barrel assembly concentrically disposed within said outer barrel assembly for limited axial movement therein and having first and second axially spaced and fluid communicating chambers therein;

slip joint means connecting said inner and outer barrel assemblies and having a tubular joint member, first and second axially spaced annular seal means between said slip joint means and a portion of said inner barrel assembly, the interior of said tubular joint member and the exterior of said portion of said inner barrel assembly forming an expansible annular chamber in fluid communication with the interior of said inner barrel assembly through at least one port in the walls thereof;

valve means carried by said inner barrel assembly movable, in response to said axial movement of said inner barrel assembly, from an open position, in which said core sample may be received by said first chamber, to a closed



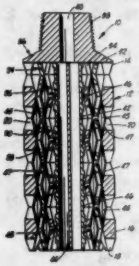
position, sealingly enclosing said core sample within said first chamber; and

pressure compensating means sealingly disposed within said second chamber allowing expansion of said second chamber for receiving expanding fluids from said core sample enclosed within said first chamber.

4,230,193
ROTARY DRILL BIT

Clifford K. Logan, Jr., Oklahoma City, Okla., assignor to Arthur G. Burki and Thomas G. Wygant, both of Oklahoma City, Okla.

Filed Dec. 13, 1978, Ser. No. 969,810
Int. Cl.[3] E21B *9/00*
U.S. Cl. 175—379 13 Claims



1. An improved rotary drill bit comprising:

an elongated generally cylindrical outer drill member having an upper end and a lower end forming an annular cutting face and having a plurality of vertically spaced rows of diamond-shaped openings formed in the wall thereof, the diamond-shaped openings in adjacent rows being offset from each other and overlapping at their upper and lower ends whereby as said lower end of said

outer drill member wears away, cutting edges are continuously formed thereon by said diamond-shaped openings;

at least one elongated generally cylindrical inner drill member disposed within said outer drill member having a length corresponding to said outer drill member, an upper end and a lower end forming an annular cutting face and having a plurality of vertically spaced rows of diamond-shaped openings formed in the wall thereof, the diamond-shaped openings in adjacent rows being offset from each other and overlapping at their upper and lower ends whereby as said lower end of said inner drill member wears away, cutting edges are continuously formed thereon by said diamond-shaped openings;

a non-perforate drilling fluid conduit disposed in said outer drill member for conducting drilling fluid from the upper ends of said outer and inner drill members solely to the lower ends thereof, said fluid conduit having diamond-shaped recesses formed in the outer surface thereof; and

means for connecting said outer drill member, inner drill member and drilling fluid conduit to a string of drill pipe and for conducting drilling fluid to said drilling fluid conduit.

4,230,194

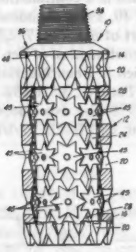
ROTARY DRILL BIT

Clifford K. Logan, Jr., 7920 Hemingford Ct., Apt. A, Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 969,810, Dec. 15, 1978. This application Feb. 23, 1979, Ser. No. 14,637

Int. Cl.[2] E21B 9/12

U.S. Cl. 175—379 **16 Claims**



1. An improved rotary drill bit comprising:

an elongated generally cylindrical outer drill member having an upper end and a lower end forming an annular cutting face;

an elongated generally cylindrical inner drill member disposed within said outer drill member having a length corresponding to said outer drill member, an upper end and a lower end forming an annular cutting face;

a plurality of vertically spaced rows of rotatable cutting members positioned around and between said inner and outer drill members and journaled thereto whereby as the lowermost row of said rotatable cutting members and said lower ends of said drill members wear away, the next adjacent row of cutting members is exposed;

a drilling fluid conduit disposed within said inner drill member for conducting drilling fluid from the upper ends of said inner and outer drill members to the lower ends thereof; and

means for connecting said outer drill member, inner drill member and drilling fluid conduit to a string of drill pipe and for conducting drilling fluid to said drilling fluid conduit attached to the upper ends of said outer drill member, inner drill member and drilling fluid conduit.

4,230,195

AUTOMATIC CONTROL METHOD AND DEVICE FOR A CONTAINER FILLING APPARATUS

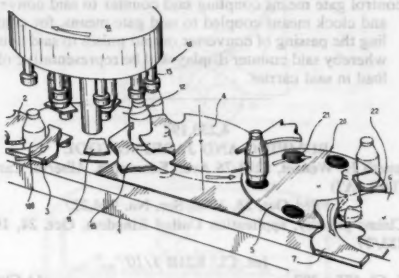
Jean-Jacques Graffin, La Ferte-Bernard, France, assignor to Serac S.A., La Ferte-Bernard, France

Filed Sep. 8, 1978, Ser. No. 940,874

Claims priority, application France, Sep. 9, 1977, 77 27407

Int. Cl.[3] G01G 15/00

U.S. Cl. 177—1 **20 Claims**



1. A method of automatically controlling an apparatus for filling containers including a plurality of filling stations, each having a controllable filling device, each actuated individually for delivering a metered amount of filling material into continuously successively forwarded containers during a filling cycle, comprising the following steps:

sequentially automatically taking individual containers among the successive containers filled at stations in the filling apparatus;

weighing successively each of said thus taken filled containers at a movable control weighing station on a continuous conveying path for the containers;

comparing each said weighing to a predetermined value image of said metered amount of filling material to be delivered into each container;

establishing a correlation between each container which has been weighed at said control weighing station and the corresponding said filling station of said filling apparatus where each said weighed container has been filled; and

automatically correcting, as a result of said control weighing, the corresponding said filling device of the filling apparatus.

4,230,196

LOAD WEIGHING AND ACCUMULATING SYSTEM AND METHOD FOR HYDRAULIC LOADER

Edwin D. Snead, Box 798, Georgetown, Tex. 78626

Continuation of Ser. No. 841,383, Oct. 12, 1977. This application Sep. 22, 1978, Ser. No. 945,075

Int. Cl.[3] G01G 19/10, 3/14

U.S. Cl. 177—141 **30 Claims**

1. A weight measuring and indicating system, for a loader having at least one hydraulic lift cylinder for elevating a load carrier, comprising

a transducer, for operative connection to said lift cylinder, for detecting instantaneous hydraulic pressure therein and for producing an instantaneous electric analog signal responsive to the instantaneous hydraulic pressure;

converter means coupled to the output of said transducer means for converting said analog signal to a frequency signal consisting of pulses generated at a frequency proportional to said analog signal;

a counter for counting and displaying the ouput pulses of said converter;

control gate means coupling said counter to said converter; and clock means coupled to said gate means, for controlling the passing of converter output pulses to said counter whereby said counter display will be representative of the load in said carrier.

4,230,197

BUMPING AND JARRING TOOL

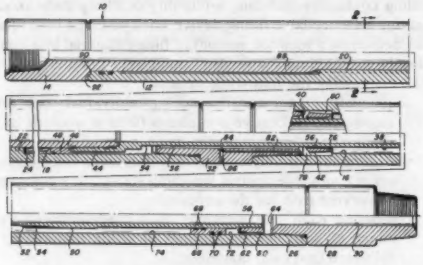
Kenneth H. Wenzel, 5203-76 Ave., Edmonton, Alberta, Canada (T6B 0A7)

Filed Oct. 24, 1978, Ser. No. 954,227

Claims priority, application United Kingdom, Oct. 24, 1977, 44223/77

Int. Cl.³ E21B 1/10

U.S. Cl. 175—297 **14 Claims**



1. A hydraulic bumping and jarring tool for a drill string, comprising:

an elongated tubular housing;

an elongated tubular mandrel telescopically mounted in said housing, said housing and said mandrel being longitudinally movable with respect to one another between an open position and a closed position;

a first pair of opposed cooperating impact faces one of which is located on said housing and the other of which is located on said mandrel to impart an upwardly directed impact or jar to the drill string when said pair of faces is brought into sudden contact at the open position;

a second pair of opposed cooperating impact faces one of which is located on said housing and the other of which is located on said mandrel to impart a downwardly directed impact or bump to the drill string when said second pair of faces is brought into sudden contact at said closed position;

said housing and said mandrel having an annular space therebetween filled with hydraulic fluid so as to define a hydraulic chamber, said hydraulic chamber having seals at its upper and lower ends;

valve means positioned on one of said housing and said mandrel and projecting into said hydraulic chamber dividing said hydraulic chamber into an upper portion and a lower portion;

said lower seal of said hydraulic chamber comprising a freely longitudinally movable member one side of which contacts said hydraulic fluid and the other side of which is subject to the ambient pressure of the well so as to impart the ambient pressure of the well to said hydraulic chamber;

volume varying means for increasing the volume of said upper hydraulic chamber portion when said tool is opening and for decreasing the volume of said upper hydraulic chamber portion when said tool is closing;

said valve means acting during closing of said tool to permit unrestricted flow of said hydraulic fluid between said hydraulic chamber portions and acting during opening of said tool to restrict the flow of said hydraulic fluid between said hydraulic chamber portions so as to cause a pressure drop in said upper hydraulic chamber portion tending to keep said tool closed as said volume varying means continues to increase the volume of said upper hydraulic chamber portion, said valve means then acting to allow unrestricted flow of said hydraulic fluid so that said first pair of impact faces is sent into sudden contact to produce a jar; and,

lower seal engaging means for increasing the pressure in said lower hydraulic chamber portion by urging said lower seal toward said valve means when said valve means acts to restrict flow.

4,230,198

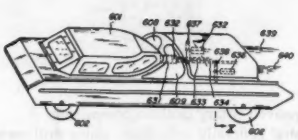
FLUID-STREAM DRIVEN GROUND VEHICLE

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 695,651, Jun. 14, 1976, abandoned, which is a continuation of Ser. No. 530,045, May 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 121,971, Mar. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation of Ser. No. 551,023, May 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898. This application Jan. 3, 1978, Ser. No. 866,880

Int. Cl.² B62D 57/04

U.S. Cl. 180—7 P **2 Claims**



1. A vehicle comprising:

a body;

at least one fluid-stream creating means on each lateral side of said body;

a fluid operated motor for driving each said fluid-stream creating means;

at least one rear wheel on each lateral side of said body;

at least one front wheel on each lateral side of said body;

a fluid operated motor for driving each said wheel;

means for producing at least four, separate, equal fluid flows; and

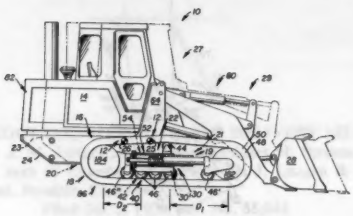
fluid-flow conrol means for selectively directing said four fluid flows to said wheel motors, respectively for low speed, four wheel drive, or combining said four fluid flows into two equal flows and either directing said two equal flows to two of said wheel motors on opposite lateral sides of said vehicle for high speed, two wheel drive or directing said two equal flows to said motors of said fluid stream creating means for fluid-stream created drive of said fluid-stream creating means.

4,230,199

APPARATUS FOR SHIFTING CENTER OF GRAVITY OF A WORK VEHICLE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 12, 1978, Ser. No. 973,043
Int. Cl.³ B62D *55/06*
U.S. Cl. 180—9.2 R **19 Claims**



1. In a work vehicle (10) having a center of gravity (12), a body (14) and a lower portion (16) having first and second continuous track assemblies (18,20), said first and second track assemblies (18,20) each having a track frame (19,21) having first and second end portions (92,93;94,95), the improvement comprising:

said lower portion (16) having a subframe (102), said subframce (102) having first and second end portions (108,110) and being movably connected to said track frames (19,21) at locations sufficient for positioning said track assemblies (18,20) one relative to the other;

a plurality of links (122,122',124,124') each having first and second end portions (126,130;126',130';128,132',128',132'), each of said first end portions (126,126',128,128') being pivotally connected to said body (14), each of said second end portions (130,130',132,132') being pivotally connected to said lower portion (16); and

power means (125) for pivotally moving said body (14) relative to both of the track assemblies (18,20) for selectively, controllably shifting the center of gravity (12).

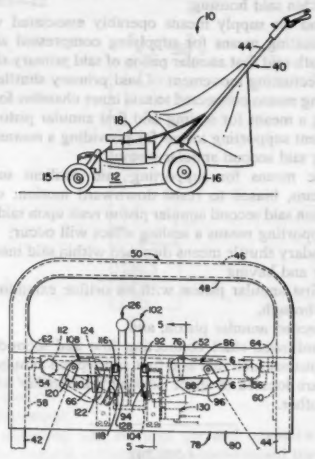
4,230,200

TWO-STAGE DEADMAN CONTROL FOR WALK-BEHIND MOWERS

Donald L. Carolan, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 21, 1979, Ser. No. 40,627
Int. Cl.³ B62D *51/04;* **B60K** *26/00*
U.S. Cl. 180—272 **14 Claims**

1. A self-propelled walk-behind implement and controls therefor including a normally disengaged tool drive clutch; a normally disengaged traction drive clutch; a guide handle having a first transverse grip portion; first and second clutch control levers respectively pivotally mounted on the handle for movement between forward clutch-disengage and rearward clutch-engage positions; first and second actuator means respectively coupled between the first lever and tool drive clutch, and between the second lever and traction drive clutch; lever latch means mounted on the handle for selectively retaining the first and second levers in their respective clutch-engage positions and including a deadman control lever including a second transverse grip portion and being vertically pivotally mounted on the handle for movement between a normal released position, wherein the second transverse grip portion is elevated above the first grip portion and an operative position wherein the second grip portion is held against the first grip portion; said lever latch means further including first and second resiliently yieldable latches operatively connected to the deadman control lever and mounted for movement, in response to movement of the deadman control lever, between respective normal lever-unlock positions, disposed out of the paths of movement of the first and second levers when the deadman control lever is in its released position, and respective lever-lock positions disposed in the paths of movement of the first and second levers when the deadman control lever is in its operative position; and first and second latch release means



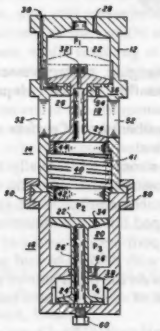
respectively operatively connected to the first and second latches for selectively yielding the latter to their lever-unlock positions when the deadman control lever is in its operative position.

4,230,201

AIR RELEASE CONTROL IN SEISMIC ENERGY SOURCE AIR GUN

Marvin G. Bays, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1978, Ser. No. 929,883
Int. Cl.³ G01V *1/14, 1/38*
U.S. Cl. 181—115 **15 Claims**



1. A seismic source apparatus comprising:

a sectional annular housing having an inner chamber for storing compressed air;

first air supply means for providing compressed air to said inner chamber;

primary shuttle means disposed within said housing having a first annular piston,

a second annular piston, and

an elongated shaft having an orifice centrally located therethrough and connected to said first and second annular pistons such that said first and second annular pistons are located in an opposed parallel relationship to one another;

actuating means for causing said primary shuttle to move within said housing;

second air supply means operably associated with said actuating means for supplying compressed air underneath said first annular piston of said primary shuttle for effectuating movement of said primary shuttle;

seating means connected to said inner chamber for providing a means for sealing said first annular piston;

resilient supporting means for providing a means for sealing said second annular piston;

elastic means for supporting said resilient supporting means, biased to resist downward motion, such that when said second annular piston rests upon said resilient supporting means a sealing effect will occur;

secondary shuttle means disposed within said inner chamber and having

a first annular piston with an orifice extending therethrough,

a second annular piston, and

a hollowed shaft connecting first and second annular pistons such that said first and second annular pistons are located in space parallel relationship to one another.

4,230,202

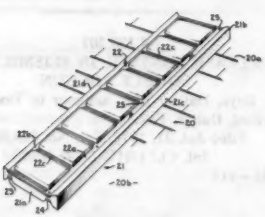
ROOFING AID

Anthony J. Kudra, III, 4837 Farley, Kansas City, Mo. 64129

Filed May 18, 1979, Ser. No. 40,193

Int. Cl.[2] E06C *7/08, 1/04, 7/46*

U.S. Cl. 182—45 **18 Claims**



1. A frictionally engaging, protective seating and working device for use on a rooflike surface comprising, in combination:

a relatively thick, resilient pad of surface adherent, non-skid, foam rubberlike material,

an open centered, strong, substantially rigid, integral first frame member positioned on one side of said pad,

said first frame member configured to substantially outline the shape of the pad but circumferentially inwardly positioned from the periphery of said pad whereby to be of lesser dimension with respect to said pad periphery,

second frame means on the other side of said pad connected to at least portions of said first frame member through said pad,

the said connections of such character as to embed the first frame member and second frame means within said pad, whereby:

on the side of the pad carrying the first frame member, portions of the pad protrude both centrally outwardly and circumferentially peripherally outwardly from said first frame member, and

on the side of the pad carrying the second frame means, portions of the pad protrude centrally and peripherally outwardly past said second frame means.

4,230,203

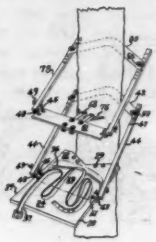
TREE CLIMBING APPARATUS

George B. Sweat, 4121 Aldington Dr., Jacksonville, Fla. 32210, and Alvin E. Warren, 1115 Lane Ave., North, Jacksonville, Fla. 32205

Filed May 1, 1978, Ser. No. 901,503

Int. Cl.[2] A63B *27/00*; A45F *3/26*

U.S. Cl. 182—134 **13 Claims**



1. A combination tree climbing and seating apparatus for an occupant wherein the occupant's legs furnish the sole power to move the occupant up the tree comprising: a lower climbing support including a foot platform provided with front and back end portions and a top surface extending generally horizontally, platform brace means connected to said foot platform and selectively engageable with the tree when the weight of the occupant is supported thereon, said platform brace means being disengageable from the tree by tilting said lower support upwardly by the occupant, and foot engageable means attached to said top surface adjacent said front end portion for firmly engaging an occupant's feet to allow the occupant to raise or lower said foot platform by lifting the occupant's legs to disengage said platform brace means and lowering the occupant's legs to re-engage said platform brace means on the tree and a climbing upper support including a seat platform having a top surface extending generally horizontally on which an occupant sits with the occupant's back against the tree when said apparatus is used for sitting and facing the tree with the occupant's knees spaced apart and straddling the tree as the occupant's legs are lifted to disengage said platform brace means and lowered to re-engage said platform brace means on the tree during climbing use of said apparatus, seat brace means connected to said seat platform and selectively engageable with the tree when the weight of the occupant is supported thereon, said upper support brace means being disengageable from the tree by tilting said upper support upwardly by the occupant, said platform brace means including a first front blade means connected to said foot platform for engaging the front of the tree, a first back blade means for engaging the back of the tree, and a pair of elongated members disposed on either side of the tree for attaching said first back blade means to said foot platform, said seat brace means including short connecting means located generally medially of and extending away from said seat platform and towards the tree to dispose said seat platform spacedly outwardly from the tree, said seat brace means further including a second front blade means connected to said short connecting means for engaging the front of the tree, a second back blade means for engaging the back of the tree, and a pair of elongated members disposed on either side of the tree for attaching said second blade means to said seat platform, said seat platform being disposed above said foot platform substantially above said foot engageable means when said platform brace means and said upper support brace means are disposed in weight bearing relationship on the tree truck, said foot platform pair of elongated members being longer than said seat platform pair of elongated members, said seat platform terminating generally medially of said foot platform, said short connecting means being sufficiently short to minimize the spaces on either side of said short connecting means and the

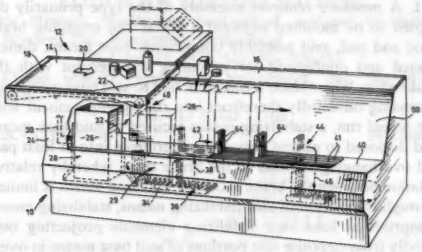
respective said elongated members of said upper support for the occupant's legs during climbing and descending and to maximize the available foot room on said foot platform for the occupant during sitting of the occupant on said seat platform with the occupant's back to the tree when said apparatus is used for sitting of the occupant.

4,230,204

CHECKOUT COUNTER WITH BAG DELIVERY MEANS

Marinus J. M. Langen, Rexdale, and Edgars H. Strauss, Toronto, both of Canada, assignors to H. J. Langen & Sons Limited, Rexdale, Canada

Filed Jul. 5, 1979, Ser. No. 55,046
Int. Cl.³ B65B *67/12*
U.S. Cl. 186—66 **6 Claims**



1. A checkout counter comprising:

(a) a counter top supported in a generally horizontally disposed first plane, said counter top having an input section extending inwardly from one end thereof toward the other end thereof and a packing section extending rearwardly from the input section,

(b) a packing platform extending longitudinally of said counter rearwardly from said input section in a generally horizontally disposed second plane spaced below said first plane to support an upwardly opening bag with its open end disposed at a convenient loading height with respect to said packing section,

(c) means in said counter below said input section adapted to dispense an open bag in a generally upright upwardly opening configuration in a generally horizontally disposed third plane spaced below said second plane a distance sufficient to permit said bag to assume a generally upright configuration when disposed below said input section of said counter top,

(d) elevator means disposed adjacent said dispenser means for movement between a lowered position and a raised position, said elevator means being arranged to receive a bag dispensed into said third plane as aforesaid when in said lowered position and being operable to raise a bag from said third plane to an elevated position in which it is supported in said second plane in alignment with said packing platform when said elevator means is moved from said first position to said second position; and

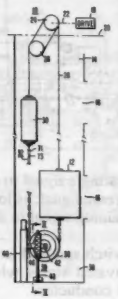
(e) conveyor means extending along said packing platform and adapted to engage a bag disposed in said elevated position and drive it in a direction away from said input section along the packing platform toward said other end of said counter top.

4,230,205

ELEVATOR SYSTEM

Richard H. Darwent, Hopatcong, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 10, 1978, Ser. No. 904,685
Int. Cl.³ B66B *7/10*
U.S. Cl. 187—22 **1 Claim**



1. An elevator system, comprising:

an elevator car,

a counterweight,

means mounting said elevator car and counterweight for guided vertical movement in predetermined travel paths, including hoist roping interconnecting said elevator car and counterweight, a traction sheave, and drive means,

and a chain compensation system free of any driving means said chain compensation system including:

at least one rotatable chain wheel disposed below the travel paths of said elevator car and counterweight,

at least one compensating chain having a plurality of interconnected links, said at least one chain being reeved about said at least one chain wheel and connected to said elevator car and counterweight,

mounting means for said at least one chain wheel, including spring means biased to divide the support of said at least one chain wheel between said spring means and said at least one compensating chain,

means for adjustably selecting the division of the support of the chain wheel between the spring means and the compensating chain, with said means being adjusted to support a substantial portion of the weight of the chain wheel on the spring means, while retaining at least enough weight on the compensating chain to enable the compensating chain to rotate the chain wheel without slippage in response to movement of the compensating chain, to reduce chain vibration due to chordal action of the chain linnks, and to reduce airborne noise due to the chain entering and leaving the chain wheel by reducing the weight exerted by said chain wheel on said compensating chain, which reduces the tension in the chain.

4,230,206

TRANSISTORIZED ELEVATOR CONTROL BUTTON

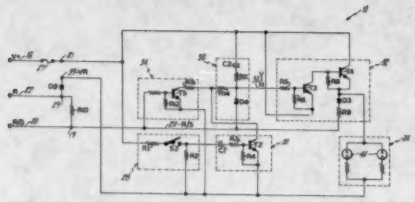
Kenneth R. Brooks, Brooklyn, N.Y., assignor to Otis Elevator Company, Hartford, Conn.

Filed Oct. 17, 1978, Ser. No. 952,223
Int. Cl.³ B66B *1/46*
U.S. Cl. 187—29 R **10 Claims**

1. Apparatus adapted for connection to a single conductor, for generating a control signal thereon from a latched, activated state, and resetable from said state in response to a reset signal selectively applied to the conductor, said apparatus comprising,

a switch selectively activated for generating the control signal upon the conductor,

latch means, in circuit with the conductor and said switch, for supplying a signal to maintain said switch in said activated state in response to said control signal, said latch means characterized in that it also generates said maintaining signal in response to said reset signal,



reset means for generating a signal to deactivate said switch, in response to the reset signal, as long as said latch means supplies said maintaining signal to said switch, in response to the reset signal,

whereby both said switch and said latch means are returned to normally deactivated states when the reset signal is removed from said conductor.

4,230,207

DISC BRAKE PAD

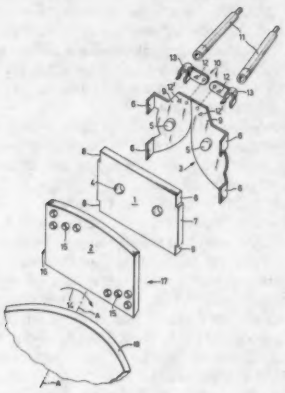
Kurt Stahl, Wahner Str. 19-21, 5000 Köln 21, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 929,985

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2734585

Int. Cl.³ F16D *69/00*

U.S. Cl. 188—73.1 **5 Claims**



1. In a disc brake pad assembly including a carrier body and a friction element affixed to the carrier body and having a work face for cooperation with a brake disc which has a major direction of rotation and a rotary axis; said friction element having a leading side and a trailing side with respect to said major direction of rotation; said carrier body having two oppositely located narrow sides spaced from one another in a circumferential direction of the brake disc; the improvement wherein said carrier body is hard porcelain; the improvement further comprising means defining a plurality of blind recesses provided in said friction element and being open solely towards said work face; said recesses being grouped such as to occupy solely zones adjacent said leading and trailing sides of said friction element and the recesses arranged in the zone adjacent said leading side being situated at a greater distance from said rotary axis than the recesses arranged in the zone adjacent said trailing side; and a protective covering attached to said carrier body and extending over a rear face of said carrier body oriented away from said friction element; said protective covering further extending over at least one part of said narrow sides of said carrier body.

4,230,208

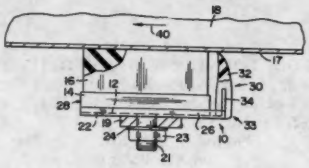
MOISTURE REMOVAL ASSEMBLY

John T. Gale, 3785 44th Ave., North, St. Petersburg, Fla. 33714

Filed Jul. 5, 1979, Ser. No. 54,858

Int. Cl.³ F16D *69/00*

U.S. Cl. 188—73.1 **7 Claims**



1. A moisture removal assembly of the type primarily designed to be mounted adjacent a wheel rim engaging brake shoe and pad, said assembly comprising: base means, dimensioned and configured for mounting engagement with the brake shoe, wiper blade means attached to said base means and extending outwardly therefrom into sliding engagement with the wheel rim, a stabilizing means secured to said base means and disposed to extend outwardly therefrom into at least partial overhanging relation to the brake shoe, whereby relative rotation between the brake shoe and said base means is limited through disposition of said stabilizing means, stabilizing means comprises at least two stabilizing elements projecting outwardly from opposite side portions of said base means in overlapping relation to opposite side portions of the brake shoe, said blade means formed from a substantially flexible material and disposed in spaced apart relation from the brake shoe and pad so as to engage the wheel rim prior to the pad when the wheel rim rotates in a predetermined direction, whereby moisture is removed from the wheel rim prior to engagement with the brake pad so as to avoid slippage therebetween.

4,230,209

MEANS OF STRINGING TROLLEY WIRES

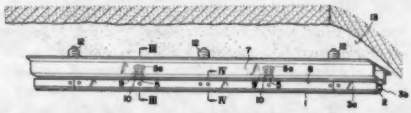
Yasushi Ohura, Tokyo; Susumu Ohwada, Yokohama; Akira Nakamura, Suita; Mitsuo Kitanishi, Nishinomiya; Yakuharu Nakamura, and Akio Tamura, both of Hitachi, all of Japan, assignors to Japanese National Railways, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Hitachi Cable Ltd., Tokyo, all of, Japan

Filed Oct. 12, 1978, Ser. No. 950,614

Claims priority, application Japan, Oct. 20, 1977, 52/125080

Int. Cl.² B60M *1/20*

U.S. Cl. 191—40 **5 Claims**



1. Means of stringing trolley wires in a railway tunnel comprising

a supporting portion fixedly installed at the inner surface of the railway tunnel, said supporting portion comprising a long box member having an opening formed at the bottom thereof,

resilient portions supported at predetermined intervals by said supporting portion, each of said resilient portions comprising a spring member and supporting rod which is protruded through said opening of said box member and adapted to move longitudinally and incline in compliance with the condition of the trolley wires, and

a sliding portion supported by said resilient portions, said sliding portion comprising a pair of long ears each having a lengthwise rigid structure and rotatively supported by said supporting rods and long trolley wires each clamped by said pair of said long ears to provide the sliding surface of said trolley wires with a lengthwise rigid structure.

4,230,210

CLUTCH FOR A TEXTILE MACHINE

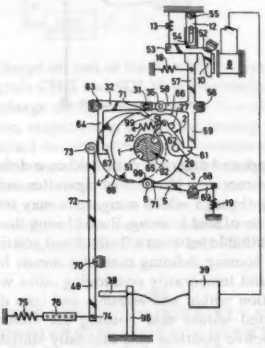
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jul. 19, 1978, Ser. No. 926,194

Claims priority, application Switzerland, Jul. 21, 1977, 009049/77

Int. Cl.[2] F16D *11/06*

U.S. Cl. 192—28 **14 Claims**



1. A clutch for moving a mechanical element of a textile machine, said clutch comprising

an intermittently rotatable input shaft having at least one recess therein;

a cam plate rotatably mounted on said shaft, said cam plate having at least one non-circular surface on a periphery thereof;

a pawl pivotally mounted on said cam plate for movement between an inoperative position spaced from said recess and an operative position engaged in said recess;

at least one controlled abutment movable from a first position in the orbit of said pawl to restrain said pawl from said recess and to a second position spaced from said orbit;

input means for movement into engagement with said non-circular surface of said cam plate to effect rotation of said cam plate independently of said shaft;

a spring biasing said input means into engagement with said cam plate; and

a limit stop on said cam plate for limiting movement of said pawl into said inoperative position, said stop being positioned to limit movement of said input means relative to said non-circular surface.

4,230,211

FREE WHEEL HUB APPARATUS FOR VEHICLES

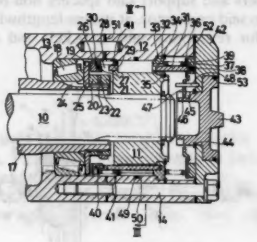
Hiromi Goto, Chiryu, and Tooru Kagata, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 18, 1978, Ser. No. 870,356

Claims priority, application Japan, Jan. 26, 1977, 52/7590

Int. Cl.[2] F16D *41/08*

U.S. Cl. 192—35 **4 Claims**



1. A free wheel hub apparatus for a vehicle including a wheel hub and an axle shaft, comprising:

a body member integrally connected and rotatable with said wheel hub,

an inner member disposed within said body member and integrally rotatable with said axle shaft,

a bearing member interposed between an outer periphery of said inner member and an inner periphery of said body member so as to rotatably engage said inner member and said body member,

a plurality of rollers interposed between said outer periphery of said inner member and said inner periphery of said body member,

a cage member loosely penetrating said bearing member and including openings within which said plurality of rollers are disposed,

a knuckle member non-rotatably mounted on said vehicle with respect to a rotational direction of said shaft,

first frictional means attached to one end of said cage member and operatively engaging or disengaging said cage member with said knuckle member according to an axial movement of said cage member;

said frictional means attached to another end of said cage member for engaging or disengaging said cage member with said body member according to said axial movement of said cage member; and

means for axially moving said cage member.

4,230,212

REAR HUB FOR A BICYCLE

Kimihiro Tsuchie, and Takafumi Harada, both of Sakai, Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

Filed Nov. 2, 1978, Ser. No. 957,019

Claims priority, application Japan, Nov. 17, 1977, 52/154896[U]

Int. Cl.[3] B62M *9/12*; F16D *41/12*; F16H *55/30*

U.S. Cl. 192—64 **8 Claims**

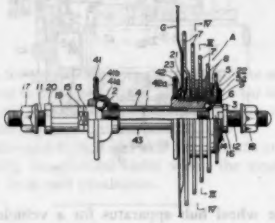
1. A rear hub for a bicycle comprising:

(a) a hub shaft;

(b) a pair of bearings;

(c) a hub shell rotatably supported to said hub shaft through said bearings, said hub shell being provided at both axial ends thereof with a pair of hub flanges and with a cylindrical bearing member extending axially outwardly of one of said hub flanges, said cylindrical bearing member having at its outer periphery a plurality of first engaging grooves and a plurality of second engaging grooves, both said first and second grooves extending axially of said cylindrical bearing member;

(d) a multi-stage sprocket assembly comprising: a plurality of different diameter sprockets, a plurality of spacers for keeping said sprockets spaced at regular intervals, and at least one connector for connecting said sprockets through said spacers and for rotatably supporting said sprockets, said connector having a rod-like shape and being insertable into one of said first engaging grooves, said connector being provided at its lengthwise intermediate portion with a plurality of engaging projections which engage with said spacers and support said spacers non-rotatably with respect to said connector, at its one lengthwise end with a stopper for restraining said sprockets and spacers from



moving in one axial direction of said connector, and at its other lengthwise end with an annular holding plate, said holding plate serving to restrain said sprockets and spacers from moving in the other axial direction of said connector and being detachably mounted with respect to said connector, each of said sprockets having a central bore fit onto said cylindrical bearing member, said central bore having at its inner periphery pawls in mesh with said second engaging grooves of said cylindrical bearing member respectively; and

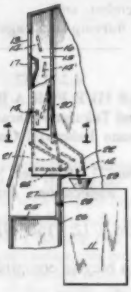
(e) mounting means for detachably mounting said multi-stage sprocket assembly to said cylindrical bearing member.

4,230,213

LIQUID REJECTING COIN CHUTE

Carl E. Spring, La Crosse, Wis., assignor to La Crosse Cooler Company, Inc., La Crosse, Wis.

Filed Dec. 26, 1978, Ser. No. 973,510
Int. Cl.³ G07F *3/04*
U.S. Cl. 194—1 K **5 Claims**



1. In a coin-operated dispensing machine having a coin chute and an electrical coin mechanism which is subject to malfunction when exposed to entry of liquid through the coin chute, the improvement for protecting the coin mechanism from such liquid, including a vertically oriented chute having a front face with a coin slot therethrough and walls which obstruct direct flow of liquid injected in said coin slot into said coin mechanism, said coin slot comprising a round hole through which coins are admitted to the chute while vertically oriented and said chute providing a gravity free fall zone for liquid and coins entering said coin slot, an opening for liquid at the bottom of the chute through which the liquid is discharged and a liquid pervious gate extending across the chute and offset below said coin opening and above the liquid opening for diverting coins from the path of liquid and for delivering the coins to the coin mechanism, said gate having a deflecting surface inclined at an angle relative to the chute to intercept free falling coins and guide the coins with the faces of the coins generally parallel to the deflecting surface toward a coin spout which is horizontally offset from the liquid outlet and for discharge into the coin mechanism

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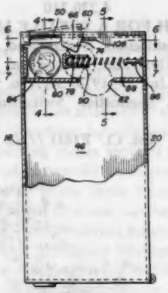
4,230,214

COIN OPERATED CIGARETTE CASE

Armando G. Cortez, P.O. Box 31413, El Paso, Tex. 79931

Filed May 15, 1979, Ser. No. 39,570
Int. Cl.³ G07F *5/02*
U.S. Cl. 194—59 **10 Claims**



1. A coin operated cigarette case, said case defining a housing in which to receive a plurality of cigarettes and defining an outlet opening through which a cigarette may be discharged from the interior of said housing, flush closing door means for said opening shiftable between a flush closed position and open position, said housing defining coin slot means for receiving coins therein and temporarily positioning coins within predetermined position within said housing, and coin displacement means supported within said housing for shifting between inactive and active positions and manually shiftable between said positions from the exterior of said housing, said door including abutment means engageable by said coins, upon displacement of the coins by said coin displacement means during its movement from said inactive position to said active position, to shift said door means from said flush closed position toward said open position.

4,230,215

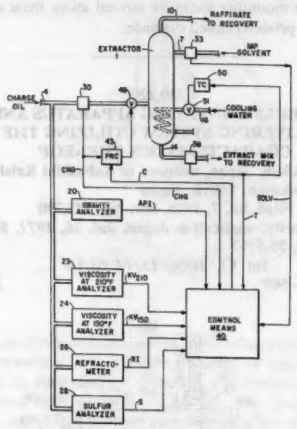
CONTROL SYSTEM FOR AN MP REFINING UNIT RECEIVING MEDIUM SWEET CHARGE OIL

Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,899
Int. Cl.³ C10G *21/00*; C06G *7/58*
U.S. Cl. 196—46 **9 Claims**

1. A control system for an MP refining unit receiving medium sweet charge oil and N-methyl-2-pyrrolidone, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, wherein said refining unit treats the received charge oil with the received methyl-2-pyrrolidone to yield extract mix and raffinate, comprising gravity analyzer means for sampling the medium sweet charge oil and providing a signal API corresponding to the

API gravity of the medium sweet charge oil, refractometer means for sampling the medium sweet charge oil and providing a signal RI corresponding to the refractive index of the charge oil, viscosity analyzer means for sampling the medium sweet charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer means for sampling the medium sweet charge oil and providing a signal S corresponding to the sulfur content of the medium sweet charge oil, flow rate sensing means for sensing the flow rates of the me-



dium sweet charge oil and of the N-methyl-2-pyrrolidone and providing signals CHG and SOLV, corresponding to the medium sweet charge oil flow rate and the N-methyl-2-pyrrolidone flow rate, respectively, means for sensing the temperature of the extract mix and providing a corresponding signal T, and control means connected to all of the analyzer means, to the refractometer means, and to all the sensing means for controlling the other flow rate of the charge oil and the N-methyl-2-pyrrolidone flow rates in accordance with signals API, KV_{210}, KV_{150}, S, RI, CHG, T and SOLV.

4,230,216

APPARATUS FOR INTERMEDIATELY STORING PRODUCTS ON STORAGE DEVICES

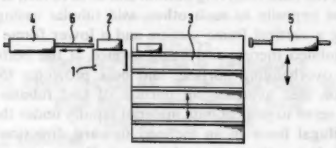
Klaus Wiens, Bad Dürkheim, Fed. Rep. of Germany, assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 18, 1979, Ser. No. 4,574

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1978, 2802339

Int. Cl.³ B65G *1/06, 1/10*

U.S. Cl. 198—347 **8 Claims**



1. Apparatus for intermediately storing products on a storage device, such as a pallet or the like, comprising:

(a) an inserter member for displacing products from a conveyor to a storage device, positioned on one side thereof and arranged for displacement transversely of the conveyor, said inserter member having a displaceable plunger combined with a planar support surface;

(b) means for discharging stored products onto said planar surface; and

(c) a stripper member positioned relative to said support surface for returning the intermediately stored products to the conveyor in conjunction with displacement of said plunger.

4,230,217

BOTTLE ALIGNING MACHINE

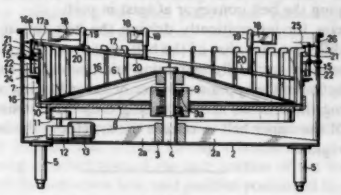
Kyuhei Ayaha, Tokushima, Japan, assignor to Shikoku Kakooki Co., Ltd., Tokushima, Japan

Filed Nov. 13, 1978, Ser. No. 960,270

Claims priority, application Japan, Nov. 16, 1977, 52-154575[U]

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—397 **5 Claims**



1. In a machine for receiving empty bottles and feeding the bottles out in a row with the mouth up to receive a liquid of the type including:

a fixed outer cylinder (1) having a cylindrical inner wall;

a rotary inner cylinder (7) coaxial with the cylindrical inner wall;

a conical bottle rolling table (6) disposed inside the cylinder for receiving the bottles supplied to the inner cylinder from above;

bottle guiding means extending from the bottle rolling table (6) along the inner periphery of the inner cylinder (7) to a position thereabove;

bottle delivering means provided on the inner periphery of the inner cylinder (7) for raising the bottles along the bottle guiding means to a position above the inner cylinder (7) and pushing out the bottles in a horizontal position over the upper edge of the inner cylinder (7);

a bottle support (24) secured to the outer periphery of the inner cylinder (7); and

means for dropping the bottles pushed out from the inner cylinder, bottom down under gravity onto the bottle support;

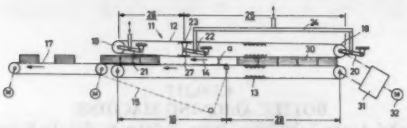
the improvement comprising:

said means for dropping the bottles onto the bottle support (24) includes intermediate bottle receiving means arranged above the bottle support (24) between the cylindrical inner wall and the inner cylinder (7) for receiving and guiding the bottles pushed out from the inner cylinder (7) in a horizontal position, and bottle position and adjusting means provided on the outer periphery of the inner cylinder (7) for moving the bottles forward along the intermediate bottle receiving means while holding them in different positions in accordance with their orientation, and dropping them bottom down from the terminal end of the intermediate bottle receiving means onto the bottle support (24).

4,230,218
APPARATUS FOR TRANSPORTING LAYERS OF SHEETS

Otto Kunzmann, Neuffen, Fed. Rep. of Germany, assignor to Bielomatik Leuze & Co., Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,248
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724980
Int. Cl.³ B65G 47/31, 15/14, 37/00
U.S. Cl. 198—461 16 Claims

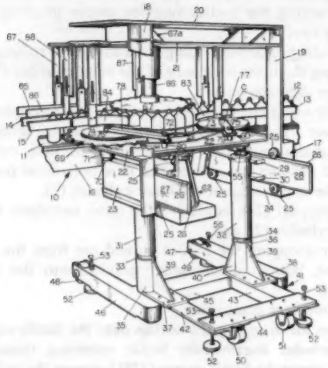


1. An apparatus for transporting articles, comprising:
a belt conveyor adapted to run at a substantially constant velocity;
a belt run, formed by upper and lower belts, which is disposed upstream of the belt conveyor, although overlapping the belt conveyor at least in part;
means for intermittently driving the belt run at velocities different than that of the belt conveyor; and,
means for cyclically increasing and decreasing the distance between the upper and lower belts for loading and engaging the articles, and for raising only the downstream end of the upper belt to release the articles in the overlapped region.

4,230,219
CAVITY IDENTIFICATION HANDLING SYSTEM

John J. Pezzin, Toledo, Ohio, and Darius O. Riggs, Ottawa-Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 21, 1979, Ser. No. 50,914
Int. Cl.³ B65G 37/00
U.S. Cl. 198—481 10 Claims

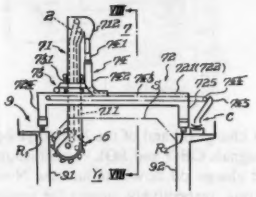


7. In apparatus for handling generally cylindrical articles through an inspection position, comprising:
a driven, horizontal conveyor for supporting and moving a line of upright articles;
an inspection device carried on a generally horizontal platform at one side of said conveyor,
spaced, fixed guide rails overlying said conveyor for maintaining the articles in a generally straight line on said conveyor;
said guide rails being interrupted to form a gap in the area opposite the location of said platform;
movable guide means in said gap for guiding articles offline of said conveyor onto said platform to thereby successively move the articles past the inspection position;
movable mounting means for said guide means and said inspection device for movement, as a unit, laterally toward and away from said conveyor; and
straight line guide means carried by said movable mounting means and movable into alignment between the fixed guide rails to fill said gap on said conveyor when said movable mounting means is moved away from said conveyor a predetermined distance.

4,230,220
VERTICAL BULK-CONVEYING APPARATUS AND BULK DELIVERING SYSTEM UTILIZING THE CHARACTERISTICS THEREOF

Fujio Iino, Tokyo, Japan, assignor to Kabushiki Kaisha Mitsu Miike Seisakusho, Tokyo, Japan

Filed Jul. 7, 1978, Ser. No. 922,790
Claims priority, application Japan, Jul. 26, 1977, 52-88811; Jan. 24, 1978, 53-5797
Int. Cl.³ B65G 15/14, 63/00
U.S. Cl. 198—509 2 Claims

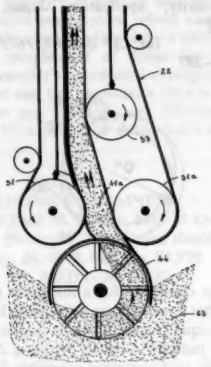


1. A vertical bulk cargo delivering system comprising: a vertical bulk-delivering unit (71) including a vertical bulk-conveying apparatus comprised of an integral combination of a vertical conveyor (2) and a highspeed bulk projector (5), and a rotary bucket wheel type bulk feeder (6) arranged on one side of said bulk projector, said bulk projector (5) including a bulk receiving chute (53) having bulk inlet mouth (530) opening toward the bulk charging port (63) of said bulk feeder, said vertical conveyor (2) being arranged in a substantially vertical space defined in a tubular casing frame and including two endless conveyor belts (2a, 2b) adapted to be driven upwardly in a substantially vertical direction in a face-to-face overlapping relation closely engaging each other along the opposite side edges thereof so as to serve the purpose of conveying bulk material as held between the opposing faces of the two conveyor belts vertically upward, said two conveyor belts being guided at the bulk-receiving bottom end so as to turn around in directions opposite to each other, said tubular casing frame including a vertical frame section and a lower frame section tiltably jointed thereto and being formed at the bottom end with an overhanging portion, said bulk projector (5) being carried on said overhanging portion of said tubular casing frame to serve to project bulk material rapidly under the effect of centrifugal force in an inclined upward direction to the bottom belt junction where the two endless conveyor belts come to join each other; a rotary boom type unloader (8) arranged for movement along a cargo handling place and including a luffing boom (82); and a unit support frame (79) mounted on said luffing boom at the free end thereof so as to be held at all times in a horizontal position and supporting said delivering unit (71) for vertical movement and rotation about the vertical axis thereof.

4,230,221
ELEVATOR-CONVEYOR FOR BULK MATERIAL

Isaac Beresinsky, Haifa, Israel, assignor to Moledeth Development Co., Ltd., Haifa, Israel

Filed Jun. 15, 1977, Ser. No. 806,962
Claims priority, application Israel, Jun. 17, 1976, 49821
Int. Cl.[2] B65G *15/14*
U.S. Cl. 198—513 **6 Claims**



1. In an elevator-conveyor for conveying bulk material over a predetermined path, at least a portion of which path is in a vertical or near vertical direction and comprising a pair of juxtaposed belts between which the bulk material is to be located and air pressure means adapted to act directly on one or both of the outer belt surfaces when the belts are in the vertical or near vertical direction so that the belts are pressed towards one another and against the interposed bulk material so as to enclose the same and so that the juxtaposed longitudinal edge portions of the belts are pressed against each other, the improvement wherein a terminal portion of the elevator-conveyor designed to be located in the vertical or near vertical direction comprising a pair of spaced apart lower drums at the lower end of the conveyor and over which the juxtaposed belts pass, and an upper drum engaged with one of the belts, the relative position of the drums causing the belts to form oppositely facing substantially straight terminal portions of said belts which are disposed at an acute angle with respect to each other and define therebetween a substantially wedge shaped feed zone, said angle not being greater than that which allows entrainment of the material therein, said zone opening outwardly from a position where the belts are substantially in contact towards a feed end of the conveyor where the belts define a maximum thickness of the feed zone, said straight terminal portions having lengths substantially greater than the maximum thickness of said feed zone, and a feed mechanism for gathering and projecting said bulk material into said feed zone.

4,230,222
GRAIN CONVEYOR ASSEMBLY

Philip G. Clark, 726 Ash Rd., Worthington, Minn. 56187

Filed Jan. 22, 1979, Ser. No. 5,478
Int. Cl.[3] B65G *37/00*
U.S. Cl. 198—580 **10 Claims**

1. A conveyor assembly for conveying material along a forward longitudinal path of travel, comprising:

a head section having a head section pulley assembled for rotation about a horizontal lateral axis;

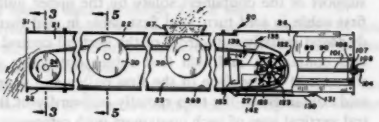
a tail section having a tail pulley assembled for rotation about a horizontal lateral axis;

one pulley being a drive pulley and the other pulley being an idler pulley;

a plurality of intermediate conveyor sections assembled between the head section and the tail section;

an endless flexible conveyor belt trained longitudinally over the head section pulley and the tail pulley and extending through the intermediate section and having an upper forward run from the tail pulley to the head section pulley, and a lower return run from the head section pulley to the tail pulley;

a plurality of conveyor belt rollers assembled in said intermediate sections for rotation about horizontal, lateral axes and positioned to carry a portion of the forward run of the conveyor belt, each said roller having a laterally concave surface whereby the conveyor belt forward run assumes a lateral concave profile as it travels over the roller to assist in maintaining material on the conveyor belt forward run;

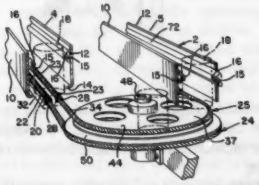


said head section pulley comprising the drive pulley, said tail pulley comprising the idler pulley, and including a tail pulley shroud having a shroud housing substantially enclosing the tail pulley and the rear portion of the conveyor belt forward run and the rear portion of the conveyor belt return run, said tail pulley having a plurality of paddles mounted in straddling relationship to the conveyor belt traveling over the tail pulley and extending radially outward thereof, said shroud having a funnel-shaped outlet opening directed toward the rear portion of the forward run of the conveyor belt, said paddles positioned to sweep accumulated spilled material from the lower portion of the shroud housing to the upper portion and then through the outlet to discharge it on the forward run of the conveyor belt.

4,230,223
PLURAL CABLE CONTAINER CONVEYOR AND TURN THEREFOR

Louis Flajnik, Berwyn, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 727,069, Sep. 27, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 940,927
Int. Cl.[3] B65G *17/00*
U.S. Cl. 198—817 **5 Claims**



1. A conveyor for a plural cable conveyor system comprising horizontal straight runs providing horizontally coplanar support surfaces for cans deposited therein and an interconnecting turn,

said turn comprising two superposed pulleys including an upper pulley and a lower pulley, each independently rotatable on a common vertical axis;

the upper pulley being of smaller diameter than the lower pulley and having an upper can-supporting surface;

a first conveying cable having a length extending from one of said runs about said upper pulley and into the other straight run and having a sector in the plane of its straight

runs projecting above the top surface of the upper pulley for supporting with said top surface of the upper pulley the bottom of a container and carrying it around said turn; and

a second cable trained about the lower pulley and coplanar with said first cable in the first run and descending at an acute angle with respect to the plane of the first cable into the turn below the upper pulley and emerging beyond the turn at an acute angle into the plane of said first cable and thereat advancing under the containers exiting from the turn and with said first cable supporting and carrying said containers in the other straight run; and

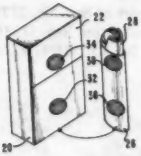
guide means disposed in offcenter relation with respect to said first cable for shifting the containers radially inwardly into said upper pulley in said turn to a position for entire support of the containers solely by the upper pulley and first cable in said turn, said first cable in said turn being disposed radially outwardly of the vertical central axis of said containers, and said first cable protruding slightly above said top surface of the first pulley and supporting said containers in the turn radially outwardly of the central vertical axes of such containers with reference to said axis of rotation of the pulley thereby slightly tilting the containers in the turn toward the axis of rotation of the pulleys, whereby centrifugal forces acting on the containers so tilted tend to bias said containers to upright positions in the turn thereby minimizing the pressure of the contact of the containers with said guide means and thus minimizing or precluding scuffing of any decorative art work or coating on the containers.

4,230,224

CIGARETTE AND LIGHTER CASE

Patrick W. Weeks, 47-360 F Hui Iwa St., Kaneohe, Hi. 96744

Filed Feb. 16, 1979, Ser. No. 12,711
Int. Cl.³ A24F *15/10*; B65D *85/10*
U.S. Cl. 206—87 **5 Claims**



1. A combination cigarette case and lighter case, comprising:

a cigarette case adapted to receive a package of cigarettes, said case including a lid movable between open and closed positions;

a tubular lighter case of non rigid material adapted to receive a cigarette lighter and to fit snugly therearound; and

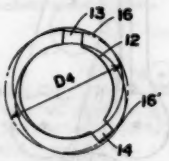
means for removably securing said lighter case to said cigarette case and for holding said lid in a closed position comprising a first set of fasteners carried by the cigarette case and a co-operable first set of fasteners carried by said lighter case; and a second set of fasteners carried by said lid and a co-operable second set of fasteners carried by said lighter case said first sets and second sets of fasteners being releasably engageable so that when said sets are engaged the lighter and said lighter case will be secured to said cigarette case and said lid will be held in a closed position.

4,230,225

STORAGE CONTAINER FOR RECORDING TAPE CARTRIDGE

Shuhei Okada, Toyonaka; Masana Uozumi, Takatsuki; Masanori Matsuura, Yawata, and Masazumi Sadaike, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Dec. 18, 1978, Ser. No. 970,395
Claims priority, application Japan, Dec. 19, 1977, 52/171461[U]
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—387 **22 Claims**



1. A storage container for a magnetic recording tape cartridge which has a pair of tape hubs, each having a plurality of hub-toothings equally spaced and having inner facing end faces and projected radially inwardly within a drive shaft inserting hole of the hub, said container comprising:

an open receptacle container body having a pair of side walls, a bottom wall and an end wall connected with each of said side walls at one end thereof;

a lid member connected with said receptacle container body for rotation to close the container; and

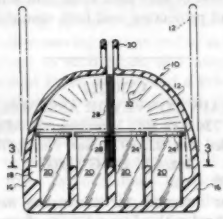
a pair of hub locking members disposed in either the receptacle container body or the lid member so as to lock said hubs against rotation, each of the hub locking members comprising a column like boss engageable within the drive shaft inserting hole of the hub, and two engaging keys substantially radially outwardly projected from said boss, wherein the improvement is characterized in that said boss has a substantially conical top portion and said keys are arranged in such a manner that at least one of said engaging keys extends into a space between two adjacent hub-toothings while the outermost portion of the other engaging key is located in radial alignment with the end face of any one of said hub-toothings.

4,230,226

EMERGENCY PRESCRIPTION KIT FOR TRAVELERS

Eldon L. Boe, 6455 LaJolla Blvd. 103, La Jolla, Calif. 92037

Filed Aug. 8, 1978, Ser. No. 932,029
Int. Cl.³ B65D *1/36, 71/00, 75/54*
U.S. Cl. 206—570 **2 Claims**



1. An emergency presecription kit for travelers comprising and characterized by:

(a) a carrying case of tough, waterproof material, said case having a base, flexible side walls with a pair of handles entirely unitary with said walls, said case having a top opening positively closed by a zipper;

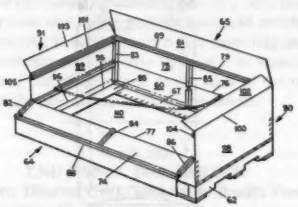
(b) said case being internally compartmented by a single layer grid holding a plurality of containers in spatially ordered arrangement on said base;
(c) said walls having form-retaining thicker lower portion with internal pockets formed thereabove adjacent to said containers with drug informational pamphlets therein; and
(d) said containers having corresponding drugs therein and container contents-identifying means visible through said top opening, the majority at least of said drugs being a standardized multiple prescription which can be professionally and quickly written en block by a user's physician as a necessary complement of drugs for a traveler, whereby a user-traveler's anticipated emergency medical needs may be met and the physician's time is reduced to that necessary for any additions and deletions of drugs contra-indicated for a particular individual's use.

4,230,227

SHIPPING CONTAINER

James L. Kowall, and Paul M. Taylor, both of Grand Rapids, Mich., assignors to Powerpak, Inc., Grand Rapids, Mich.

Filed Oct. 24, 1979, Ser. No. 84,970
Int. Cl.[3] B65D *6/26, 19/20*
U.S. Cl. 206—600 **21 Claims**



1. A folding box comprising:
a base;
a pair of first opposing panels secured to said base, said first panels including a score line adjacent said base and dividing each first panel into a side wall foldable into a generally perpendicular position relative to the base along said score line and a base flap secured to said base;
a pair of second opposing panels, each including a score line adjacent said base and dividing each second panel into a bottom flap overlying the surface of said base and an end wall foldable into a generally perpendicular position relative to the base along said score line;
at least one rigid horizontal reinforcing member secured to each of said end walls, said at least one rigid horizontal reinforcing member having a length equal to that of the end wall;
rigid vertical supports provided along lateral edges of the side walls and secured thereto, said rigid vertical supports each having a bottom surface which seats against the bottom flap of a second panel when the side walls are in an upright position, thereby frictionally holding the second panels on the base;
a rigid brace disposed laterally on each of said side walls adjacent an upper edge thereof and secured thereto for further rigidifying said framework; and
means forming a rigid interlocking vertical connection between said at least one rigid horizontal reinforcing member, said laterally-disposed rigid brace and said rigid vertical supports;
whereby said rigid vertical supports, said laterally-disposed rigid brace and said at least one rigid horizontal reinforcing member cooperate, when interlocked, to form a rigid framework for said container and when said vertical supports, said laterally-disposed rigid brace and said rigid horizontal reinforcing member are not interlocked, said score lines permit folding of said side and end walls to a collapsed position, thereby facilitating storage of said container.

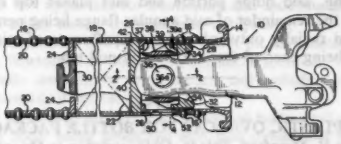
14. A folding box comprising:
a base;
a pair of first opposing panels secured to said base and pivotally connected thereto to form opposing side walls;
a pair of second opposing panels each including an end wall foldable into an upright portion along a first score line adjacent said base and a bottom flap arranged to overlie a portion of a top surface of said base and secured thereon;
two horizontal support members fixed to each end wall between a top edge thereof and the bottom flap;
a laterally-arranged brace disposed across the upper edge of each first panel;
vertical supports including two axially arranged struts secured to the lateral edges of each first panel and longitudinally spaced apart to define a first slot;
said vertical supports forming a second slot defined by said laterally-arranged brace and a top surface of a strut of said vertical supports; and
said horizontal support members received by said first and second slots in an interlocking relationship when the box is assembled;
whereby said interlocked vertical and horizontal supports form a rigid framework for said container and provide for easy assembly of said container.

4,230,228

PIN TYPE SOLID BUTT ROTARY COUPLER

John W. Kaim, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 23, 1978, Ser. No. 953,922
Int. Cl.[3] B61G *9/00*
U.S. Cl. 213—62 A **5 Claims**



1. In a rotary type railroad car coupler assembly including a sill, a striker secured to said sill, a coupler having a head and a shank, a draft gear, a yoke positioned so as to act in concert with said draft gear and said striker to transmit draft forces from said coupler to said sill, said yoke having a substantially cylindrical cavity therein, a yoke collar disposed in said cavity, said yoke collar having two substantially opposing ends and two substantially opposing pin apertures therein, said yoke collar acting to receive at least a portion of said shank end to transmit draft forces from said coupler head to said yoke, and a pin connecting said yoke collar and said shank whereby said yoke collar and said shank are free to rotate within said yoke cavity, said pin being fitted into both of said pin apertures in said yoke collar, the improvement which comprises a yoke collar constructed so that said collar is capable of being reversibly disposed within said yoke cavity, and said yoke invertibly disposed within said striker and said sill.

4,230,229

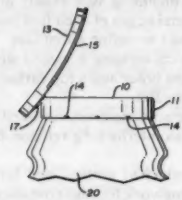
SNAP ON BOTTLE CAP

Harry Crisci, New Castle, Pa., assignor to Northern Engineering & Plastics Corporation, New Castle, Pa.

Continuation-in-part of Ser. No. 967,390, Dec. 7, 1978. This application Feb. 21, 1979, Ser. No. 13,269
Int. Cl.[3] B65D *41/48*
U.S. Cl. 215—253 **5 Claims**

1. A resilient deformable cap comprising a planar top, an annular flange depending from the peripheral edge of the top

and having a lower peripheral edge, an annular rib on the inner surface of said annular flange, a reinforcing ring positioned in closely spaced relation to and around the outer surface of said annular flange, said ring having a bottom peripheral edge located beneath said annular flange lower peripheral edge, a vertical hinge portion in said annular flange, said hinge portion beng defined by a pair of circumferentially spaced vertical slots defined in said annular flange and extending from said top peripheral edge to said annular flange lower peripheral edge so that said hinge portion is flexible radially outwardly of said annular flange, a portion of said reinforcing ring being integrally attached to said annular flange at said hinge portion and a plurality of circumferentially spaced frangible elements closely connecting the remainder of said reinforcing ring with



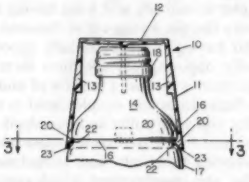
the remainder of said annular flange, said hinge portion of said annular flange being normally held in position to be in circumferential alignment with the remainder of said annular flange by said reinforcing ring, said hinge portion of said annular flange being deformable by movement of said reinforcing ring so that moving said reinforcing ring to break said frangible elements deforms said hinge portion outwardly and upwardly of said annular flange so that said deformed hinge portion in combination with said reinforcing ring forms a fulcrum of a pull tab upon which pulling force is exerted via said reinforcing ring, said hinge portion and said planar top remaining intact the remainder of said annular flange being permitted to expand radially outward under the influence of said pulling force being exerted thereon via said pull tab.

4,230,230

PLASTIC OVERCAP FOR BOTTLE PACKAGE

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 1, 1979, Ser. No. 34,716
Int. Cl.³ B65D *41/16, 41/18, 41/22*
U.S. Cl. 215—321 **5 Claims**



1. A container package comprising the combination of a container having an annular body wall including a neck and closure receiving finish at one end defining an opening and a closure engaged thereon closing the container, the annular body wall including an annular bead spaced below the finish and having an apex thereon and groove of lesser diameter below said apex,

an overcap of generally cup-shaped configuration made of a deformable plastic material, said overcap including an integral end wall and annular side wall, the latter defining a circular rim opening opposite the end wall,

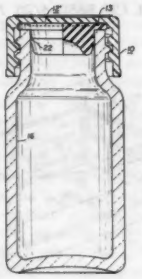
a plurality of inwardly protruding lugs on the inside of said annular side wall approximately adjacent said rim end thereof, each of said lugs including an axial, downwardly and inwardly tapering rib and apex, the apex of said lugs being described to lie along a generally circular line projection, the diameter of said circular line projection being less than the diametrical apex dimension of said annular bead on the container wall, the lugs of the overcap engaging collectively over said bead on the container and axially beyond the apex in a cup-inverted fashion placing the annular section of the overcap side wall in tension and distorting the arcuate configuration of the side wall segment between two adjacent lugs thereon to a segment of increased radius.

4,230,231

CLOSURE CAP

Robert R. Burnett, Sunrise, and John W. Box, Miami, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 930,157, Aug. 1, 1978. This application Apr. 16, 1979, Ser. No. 30,158
Int. Cl.³ B65D *39/08*
U.S. Cl. 215—329 **10 Claims**



1. For use in the medical and biochemical art field, a reusable and removable closure cap for sealing a vial which has a uniformly dimensioned cylindrical opening exteriorly threaded at one end, comprising as a single integral unit a rigid tubular cover of plastic material interiorly threaded for registering with the threads on said vial, said cover being closed at only one end, a plug-type stopper of highly elastic and relatively soft material having a flat top area and a coaxially positioned bottom tapered portion, that part of said stopper which is below said flat top area having an annular lip intermediate the ends thereof which has a lateral dimension larger than the diameter of said cylindrical opening, but smaller than the lateral dimension of said flat top area, said tapered portion being adapted to enter the open end of said vial and to provide with said lip a liquid and air-tight seal for the contents of said vial, and a pressure-sensitive material of strong-bonding adhesive qualities bonding the central top portion of said rigid tubular cover in its interior to the central flat top portion of said highly elastic stopper, said stopper being characterized by its ability at room temperature to stretch under low stress and to return rapidly to its original shape upon release of stress.

4,230,232

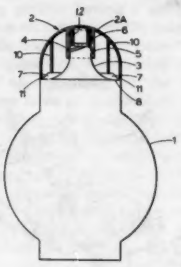
BOTTLE WITH CLOSURE CAP

Herbert A. Atkins, Maidenhead, England, assignor to Beecham Group Limited, Great Britain

Filed Mar. 19, 1979, Ser. No. 21,711
Claims priority, application United Kingdom, Mar. 18, 1978, 10799/78
Int. Cl.³ B65D *41/04*
U.S. Cl. 215—330 **4 Claims**

1. A capped bottle which comprises a bottle having a threaded neck portion of circular horizontal cross-section positioned on a shoulder portion of non-circular horizontal

cross-section in head-and-shoulders relationship, a cap threadedly engaging said neck portion, the cap having a tubular socket part which screws onto the neck of the bottle and a skirt part enveloping the tubular socket part and conforming at the hem of the skirt part with the horizontal cross-sectional shape of the shoulder, a notch bearing member on one of the cap and the bottle and a protuberance on the other of the cap and the



bottle, said notch bearing member and said protuberance cooperating such that the protuberance bears on said member after the start of the threading movement of the cap onto the neck of the bottle, at least one of the protuberance and notch bearing member deforming to accommodate said threading movement until the protuberance snaps into the notch to terminate said movement, and out of the notch at the start of the threading movement of the cap off the neck of the bottle.

4,230,233

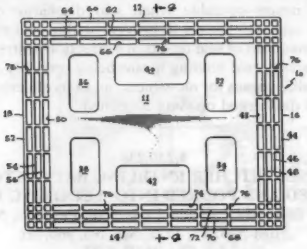
END PANEL FOR CARTON

Robert P. Orr, Tiburon, Calif., assignor to Bendix Forest Products Corporation, San Francisco, Calif.

Filed Nov. 6, 1978, Ser. No. 958,292

Int. Cl.³ B65D *5/12, 8/18*

U.S. Cl. 217—36 **9 Claims**



1. In a container having top, bottom and side panels:

a pair of end panels to which said top, bottom and side panels are fastened, each said end panel comprising a molded frame of high density plastic, said frame including

a face panel of area significantly more than half of the area of said end panel,

top, bottom and side rim sections attached around the periphery of said face panel and of a depth equal to the desired thickness of said end panel, said face panel being attached to the inside edges of said rim sections,

a plurality of ribs extending across said face panel between at least two of said rim sections,

each of said side rim sections comprising an inside wall extending the entire height of said end panel, an outside wall, a plurality of internal walls spaced between and parallel to said inside and outside walls extending the entire height of said end panel and a plurality of reinforcing cross members extending between said inside wall and said outside wall,

each of said top and bottom rim sections comprising an inside wall extending the entire width of said end panel, an outside wall intersecting the outside walls of said side rim sections, a plurality of internal walls spaced between and parallel to said inside and outside walls of said top and bottom rim sections and extending the entire width of said top and bottom panels and a plurality of reinforcing cross members extending between said inside and outside walls,

said face panel being attached to and framed by adjoining internal edges of said inside walls of said top, bottom and side rim sections.

4,230,234

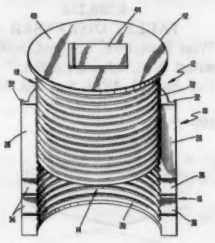
METER BOX ASSEMBLY

James B. Taylor, P.O. Box 814, Jeffersonville, Ind. 47130

Filed May 9, 1979, Ser. No. 37,320

Int. Cl.³ B65D *25/20, 8/04, 8/14, 6/26*

U.S. Cl. 220—18 **14 Claims**



1. Meter box apparatus for containing and securing an underground utility meter, the apparatus comprising:

a cylindrical meter box for use as a meter pit, said meter box being fabricated in two complementary sections of substantially semicircular cross section and including means for assembling the two sections;

a meter box cover including a cylindrical body, said cylindrical body being insertable into said cylindrical meter box;

mutually interacting means respectively integral with said meter box and said cover for adjusting the height of said apparatus; and

meter-securing means adjustably positionable to selectable, predetermined positions with respect to the height of said meter box and secured between said two sections.

4,230,235

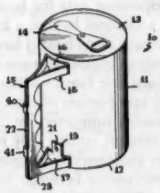
BEVERAGE CAN HANDLE

Paul E. Di Amico, 1180 S. Palm Canyon Dr., Palm Springs, Calif. 92262

Filed Apr. 20, 1979, Ser. No. 31,857

Int. Cl.³ B65D *25/28*

U.S. Cl. 220—94 R **8 Claims**



1. Handle means and beverage can combination comprising:

a beverage can having a sidewall of cylindrical configura-

tion of substantially equal cross sectional thickness presenting a continuous, circular exterior surface separated by a top end and bottom end;

handle means permanently secured to said beverage can exterior surface having a first position flush thereagainst and a second position folded over upon itself to outwardly project from said beverage can exterior surface without reduction of beverage can wall thickness;

said handle means comprising a pair of spaced apart end strips adjacent said top and said bottom respectively with a pair of side elements vertically disposed joining the respective opposite ends of said end strips so that a central opening is defined therebetween;

said end strip adjacent said beverage can bottom is co-extensive therewith so as to cooperatively support said beverage can on a flat surface;

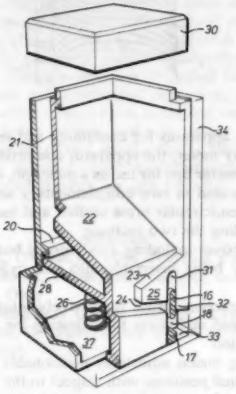
said handle means further having an oval configuration in its first position and a substantially U-shaped configuration in its second position.

4,230,236

TABLET DISPENSER

Clive Boulter, West Bridgford, England, assignor to The Boots Company Limited, Nottingham, England

Filed Jun. 21, 1979, Ser. No. 50,874
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—190 **8 Claims**



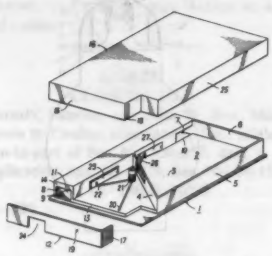
1. A tablet dispenser for use in repeatedly dispensing a predetermined number of generally cylindrical tablets of uniform size randomly orientated in the dispenser, the dispenser comprising an outer case with a base and an inner part slidably mounted in the outer case for linear movement between a dispensing position and a non-dispensing position, the inner part being biased away from said base towards a resting position, the inner part and outer case together defining a container for the tablets, a dispensing gate for housing a predetermined number of tablets, a channel having a bottom sloping downwardly towards the gate, said channel having a portion open to the container and being defined between the inner part and the outer case, and at least one ramp surface at the bottom of the container leading to said portion of the channel so as to direct tablets into the channel supported on their peripheries in a single tablet width column, so that they roll down the channel towards the gate, the inner part being operated against said bias to cause relative movement between the gate and channel, from one position wherein said gate is in register with the channel and another position wherein the gate is in register with a dispensing outlet located in the lower part of the dispenser.

4,230,237

TABLET DISPENSER

Erik de Wit, Vienna, Austria, assignor to Hermes Süsstoff AG, Zurich, Switzerland

Filed Nov. 21, 1978, Ser. No. 962,689
Claims priority, application Austria, Nov. 28, 1977, 8508/77; Aug. 25, 1978, 6208/78
Int. Cl.³ B65D *83/04*
U.S. Cl. 221—298 **7 Claims**



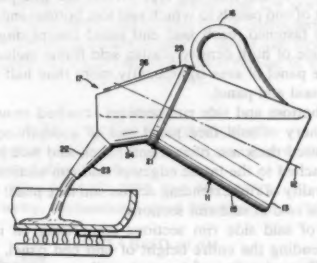
1. A tablet dispenser comprising: wall means defining a feed duct dimensioned to permit passage therethrough in a given direction of tablets to be dispensed by said tablet dispenser, said feed duct being defined with a discharge opening at one end thereof; slide means movable to open and close said discharge opening to enable selective dispensing of tablets therefrom; clamping means operable to prevent movement within said duct means in said given direction of tablets located beyond a predetermined distance upstream of said discharge opening, said clamping means comprising a portion of said wall means adapted to be displaced inwardly of said duct means; spring means operably engaged between said slide means and said portion of said wall means to effect displacement of said portion inwardly of said duct means when said slide means is moved to open said discharge opening; and holding means located along said duct means further upstream than said clamping means operable when said discharge opening is closed by said slide means to prevent within said duct means reverse movement of said tablets in a direction upstream of said given direction, said holding means being operably connected with said slide means for movement out of its effective position when said discharged opening is opened.

4,230,238

FUNNEL PITCHER ENABLING BATTER TO BE PREPARED AND POURED INTO A COOKING UTENSIL

Warren Wilson, 644 Paramus Park Mall, Paramus, N.J. 07652

Filed Nov. 13, 1978, Ser. No. 960,461
Int. Cl.³ B67D *5/38*
U.S. Cl. 222—158 **5 Claims**



1. A utensil for enabling batter to be prepared and poured

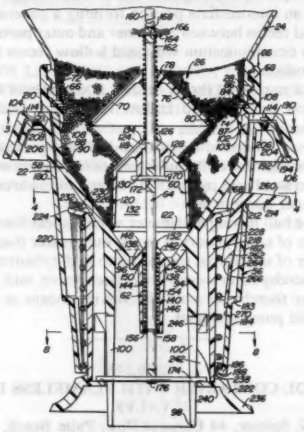
into a cooking utensil comprising an upstanding vessel portion for ingredients of the batter, said vessel portion having a flat bottom, a vertically extending longitudinal axis and a region through which batter flows at right angles to the axis, a pouring portion extending above the region so that batter flows through the region to the pouring portion when the axis is tilted approximately to the horizontal, said pouring portion having a spout with a lower straight edge at a predetermined angle above the horizontal when the vessel portion axis is vertical, said pouring portion having a straight sloping side leading from the region on one side of the vessel portion to the lower edge to provide a guide for the batter from the vessel portion through the spout into the cooking utensil when the vessel axis is tilted approximately to the horizontal, said straight edge extending from an intersection with the sloping side to the end of the spout, said straight side being at a greater angle to the horizontal than the lower straight edge when the axis is vertical, the pouring portion including a face inclined at approximately 45 degrees above the horizontal when the axis is vertical, the face extending from the region and the side opposite from the one side of the vessel portion to a downwardly extending retaining wall for the batter, the retaining wall extending to an upper side of the spout, said face having an opening positioned to enable the user of the utensil to see the contents as the contents are poured through the spout into the cooking utensil, said region and opening being positioned relative to each other and having an area sufficiently large to enable ingredients of the batter to be easily poured through them into the vessel portion said predetermined angle being approximately 23 degrees such that dripping of batter from the spout is prevented after pouring and when the axis is returned to the vertical and the batter is prevented from flowing through the opening during pouring of the batter through the spout.

4,230,239

CYCLICALLY OPERABLE DISPENSER PROVIDING A DOUBLE CLOSURE BETWEEN DISPENSING CYCLES

Peter L. Birrell, South Delta, Canada, assignor to Acro-Matic, Inc., Warrington, Pa.

Filed Mar. 13, 1978, Ser. No. 886,192
Int. Cl.³ G01F *11/28*
U.S. Cl. 222—185 **9 Claims**



1. A cyclically operable mechanism for dispensing measured quantities of a flowable material from a reservoir of such material comprising:

a funnel having an inlet, an outlet smaller than said inlet, and an interior wall tapering from said inlet to said outlet;

a reciprocable rod extending through said outlet;

a metering member mounted above said outlet on said rod for relative movement with respect to said rod between a charging position, in which said metering member is spaced a predetermined distance from said interior wall, and a dispensing position in which said metering member abuts said interior wall to form a dispensing chamber therewith;

a closure member mounted below said outlet on said rod for relative movement with respect to said rod between a closed position, in which said outlet is closed, and an open position in which said outlet is opened;

means, operatively connected to said rod, for reciprocating said rod from an upper position, in which said metering member is in said charging position and said closure member is in said closed position, through a first intermediate position, in which said metering member is in said dispensing position and said closure member is in said closed position, through a second intermediate position, in which said metering member is in said dispensing position and said closure member is in said open position, to a final position in which said metering member is in said dispensing position and said closure member is in said closed position; and

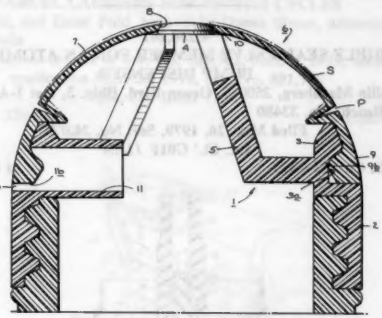
means, operatively connected to said rod, for recycling said rod to said upper position.

4,230,240

DISPENSING VALVE PARTICULARLY FOR VISCOUS PRODUCTS AND HAVING A DOME-SHAPED APPLICATOR

Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Continuation-in-part of Ser. No. 969,796, Dec. 15, 1978. This application Jul. 17, 1979, Ser. No. 58,247
Int. Cl.³ B05B *11/04*
U.S. Cl. 222—212 **7 Claims**

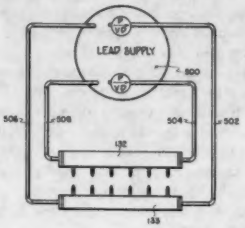


1. A dispensing valve having a base comprising a circular rim, means for connecting said rim to a squeeze bottle's mouth, a circular wafer, and spokes connecting with and radiating from the wafer's bottom and extending radially to the rim in a plane below said bottom and positioning the wafer on and normal to the rim's axis, said wafer having a small diameter as compared to the rim's diameter and forming an annular space between the wafer and rim; and a cap comprising an elastically flexible annular diaphragm having a central portion positioned above said plane, said portion having a central opening with a periphery normally resting on the periphery of said wafer, and said diaphragm having a depending flange connected to said rim, said peripheries having substantially mating conical surfaces; wherein the improvement comprises said diaphragm being upwardly dome-shaped so it has an outer applicator surface that is ball-like in appearance.

4,230,241
LADLE FOR DELIVERING A PLURALITY OF ALIQUOTS OF MOLTEN METAL

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 752,644, Dec. 20, 1976. This application Mar. 5, 1979, Ser. No. 17,868
Int. Cl.[3] B22D *39/02, 41/04*
U.S. Cl. 222—252 13 Claims

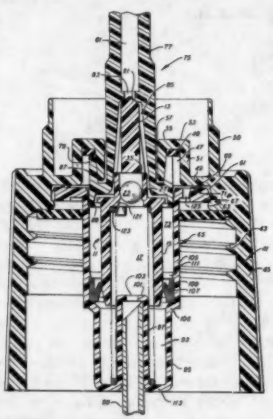


1. A ladle for casting lead battery parts by simultaneously delivering a plurality of preselected aliquots of molten lead to each of a plurality of part molds comprising:
(a) a ladle chamber, movable between standby and pouring positions;
(b) a plurality of delivery orifices, disposed in said chamber, one for each part mold to be supplied;
(c) means for circulating molten lead through said ladle chamber when said chamber is in the standby position; and
(d) means for isolating molten lead within said chamber and for delivering said molten lead to said orifices as said chamber is moved to pouring position.

4,230,242
TRIPLE SEAL VALVE MEMBER FOR AN ATOMIZING PUMP DISPENSER

Philip Meshberg, 2500 S. Ocean Blvd. Bldg. 3, Apt 1-A, Palm Beach, Fla. 33480

Filed Mar. 26, 1979, Ser. No. 24,070
Int. Cl.[3] G01F *11/04*
U.S. Cl. 222—321 4 Claims



1. In an atomizing dispensing pump comprising:
(a) means defining a pump chamber of substantially fixed volume having an inlet, said pump chamber having an opening at the inner end thereof;
(b) valving means disposed at said inlet for preventing a back flow from said pump chamber;
(c) a pump stem having a piston on the end thereof disposed for reciprocal motion in said pump chamber;
(d) said pump stem having a passageway therethrough with a dispensing outlet at the outer end of said passageway and an axial inlet port located inwardly thereof;
(e) a rigid valve member having an outer end portion cooperating with said axial inlet port to close off said port and an inner portion of a predetermined cross-sectional sealing area and of a length corresponding to the range of movement of said piston;
(f) an annular member forming a throat disposed at said opening at the inner end of said chamber, said inner portion of said valve member cooperating with said annular member to form means sealing the inner end of said pump chamber with a surface to surface seal at said throat, as said pump is operated by depressing said pump stem, to prevent any flow from said pump chamber through said throat when said pump is dispensing;
(g) detents formed on the inside of said pump body to retain said annular member in place.
(h) means for supplying liquid in a container to said valving means;
(i) means biasing said valve member outwardly so that the first end portion thereof closes off said inlet port, and thereby also biasing said pump stem outwardly;
(j) the cross-sectional area closed off at said inlet port being smaller than the cross-sectional area of said second end portion of said valve member at the point where it is sealingly guided,
(k) said rigid valve member being;
(l) an integrally molded plastic having:
(i) said outer part terminating in a sealing tip for sealing against said inlet port, said outer part being of a first cross section;
(ii) said inner part containing therein a hollow recess open at its inner end for accepting said means biasing, said inner part being of a larger cross section than said outer part, the radially outer portion of said inner part adapted to seal against said annular member;
(iii) an intermediate portion forming a generally cylindrical recess between said inner and outer parts, said recess in communication with said hollow recess in said inner portion;
(iv) a narrowed throat formed at the area of communication between said hollow recess and said cylindrical recess;
(v) said intermediate portion having openings therein in the vicinity of its outer end permitting communication between said cylindrical recess and the area above said inner portion; and
(vi) a ball having a diameter which is less than the diameter of said cylindrical recess but greater than the diameter of said throat snapped into said cylindrical recess to thereby form therewith a check valve, said valve member thereby forming the valving means at the inlet to said pump chamber.

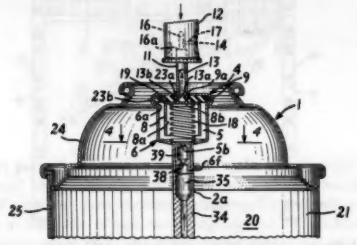
4,230,243
AEROSOL CONTAINER WITH FLAMELESS DELIVERY VALVE

Joseph G. Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10003; Marvin Small, 1100 Park Ave., New York, N.Y. 10021, and Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07901

Continuation-in-part of Ser. No. 754,471, Dec. 27, 1976, Pat. No. 4,124,149. This application Aug. 8, 1978, Ser. No. 932,067
Int. Cl.[3] B65D *83/14*
U.S. Cl. 222—402.18 23 Claims

1. An aerosol container for use with compositions containing

liquefied flammable propellants, and having a delivery valve that delivers a spray that in either flameless or at worst has an abnormally low flame extension, whether the container is in an upright position or in a fully inverted position, comprising, in combination, a pressurizable container having at least one storage compartment for a liquefied aerosol composition and a liquefied propellant; a delivery valve movable manually between open and closed positions, and including a valve stem, a valve stem passage, a valve stem orifice at the beginning of the valve stem passage, and a delivery port; a mixing chamber having at least one liquid tap orifice and at least one vapor tap orifice in flow connection with the storage compartment for reception therefrom and mixing together in the chamber liquid aerosol composition and gaseous propellant, respectively; an



aerosol-conveying passage in flow connection at one end with the mixing chamber and at the other end with the valve stem orifice, manipulation of the delivery valve opening and closing the passage to flow of liquid aerosol composition and gaseous propellant from the storage compartment to the mixing chamber and delivery port; and at least two flow constrictions disposed across the passage in the line of flow from the mixing chamber to the valve stem orifice, each constriction having an open area within the range from about 0.05 to about 0.4 mm^2, and at least two expansion chambers, one following each constriction, each having a diameter of at least 25% greater than that of the preceding constriction, thereby increasing the gas:-liquid volume ratio in the mixture leaving the delivery port and reducing the flammability of the delivered spray.

4,230,244

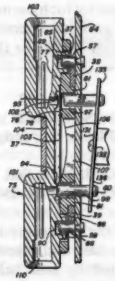
FLUID-FLOW LIMITING APPARATUS FOR USE WITH INTRAVENOUS-SOLUTION ADMINISTERING EQUIPMENT

Nick Zissimopoulos, Schaumburg, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 878,970, Feb. 17, 1978, Pat. No. 4,185,759. This application Aug. 30, 1979, Ser. No. 71,411

Int. Cl.³ A61M *5/14*

U.S. Cl. 222—450 **12 Claims**



1. In a controller for use with a casette having:

(1) metering means for holding a predetermined volume of fluid;

(2) closable inlet means in fluid communication with said metering means for permitting the flow of a fluid into said metering means; and

(3) closable outlet means in fluid communication with said metering means for permitting the flow of fluid out of said metering means, said controller having:

(a) first rigid member means, movable between a first position and a second position, said first member means for, when in said second position, closing said inlet means;

(b) second rigid member means, movable between a third position and a fourth position, for, when in said fourth position closing said outlet means; and

(c) actuating means, connectable to and operated on a source of power, for selectively moving said first member means to said second position to close said inlet means and alternatingly moving said second member means to said fourth position to close said outlet means, the improvement comprising rocker arm means pivotally attached at a location adjacent to electromagnet means, said rocker arm means carrying at their ends separate, first and second magnets defining poles of opposite polarity extending outwardly in generally normal relationship to said rocker arm means, said electromagnet means including ferromagnetic material, magnetizable by said electromagnetic means, said ferromagnetic material defining a pair of arms which assume the same polarity upon magnetization, said arms being each positioned adjacent said first and second magnets to attract and repel said magnets dependent upon the induced polarity of said ferromagnetic material, said first and second rigid member means being carried by the rocker arm means.

4,230,245

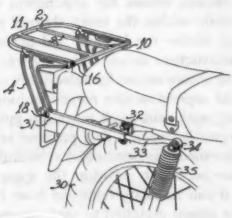
PARCEL CARRIERS FOR MOTOR CYCLES

Juri Pold, and Ilmar Pold, both of 24 Ozone Street, Alberton, Australia

Continuation-in-part of Ser. No. 629,702, Nov. 6, 1975. This application Mar. 30, 1978, Ser. No. 891,762

Int. Cl.³ B62J *7/04*

U.S. Cl. 224—39 **2 Claims**

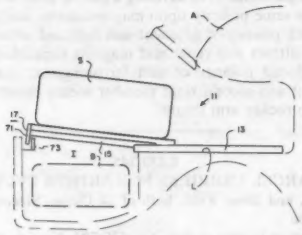


1. A parcel carrier for motor cycles of various sizes employing a parcel support frame of one uniform size arranged to be held rearward of a motor cycle seat and above a rear wheel of a motor cycle of any conventional size at a shock absorber of said cycle, said frame having associated therewith side supports arranged to provide sole support for the parcel frame, said side supports being positioned on each side of said frame, to be on each side of the rear wheel of said motor cycle and be secured to the structure of the motor cycle at two spaced apart locations wherein: each of the side supports is comprised of separable portions including a side strut; said side strut having an upper portion interlocking with and being removably secured to said frame; a stabilizing arm sized for use with said motor cycle; said stabilizing arm having a rearward portion and a forward end, said rearward portion interlocking with

and being separable from a lower portion of the side strut and said forward end being secured to an upper end of said shock absorber of the motor cycle, and a bracket sized for use with the said motor cycle secured at an outer end in a removable manner to a lower forward portion of said side strut and extending inwardly from its secured outer end to an inner end which is adapted to be secured directly to the structure of the motor cycle; and

wherein said side strut has a forwardly extending extension arm thereon, with a forwardly open bore formed therein, said stabilizing arm having its rearward portion telescopically received in said open bore and arranged to allow relative freedom of movement in a forward to rearward orientation between the stabilizing arm and the side support to adjust the parcel carrier to the size of the said motor cycle, and being further arranged to lock the side support against any substantive rotational freedom of movement about any transverse horizontal axis relative to the stabilizing arm.

4,230,246
SPARE TIRE CARRIER
Thomas S. Wilson, 209 S. Holmes, Memphis, Tenn. 38111
Filed Apr. 11, 1979, Ser. No. 29,137
Int. Cl.³ B60R *9/00, 7/02*
U.S. Cl. 224—42.21 **6 Claims**



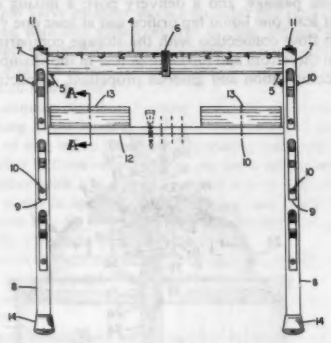
1. An apparatus for being positioned within the trunk of an automobile and for supporting a spare tire for the automobile, said apparatus comprising:

(a) substructure means for attachment to structure of the automobile within the trunk thereof in a location which will not hinder the loading and unloading of the trunk, said substructure means including track means;

(b) superstructure means for selectively supporting the spare tire, said superstructure means including race means for coacting with said track means to guide said superstructure means between a first position in which said superstructure means is positioned substantially over said substructure means to position the spare tire in a location where it can be easily removed from the trunk; and

(c) tongue means attached to said superstructure means for engaging structure of the automobile when said superstructure means is in said second position; said substructure means including a plurality of roller means for slidably supporting said superstructure means; said track means including first and second track members; said race means including first and second race members for coacting with said first and second track members respectively; said substructure means including a pan member having an upper surface and having opposing first and second upturned side edges; said first track member being defined in part by said first upturned side edge of said pan member; said second track member being defined in part by said second upturned side edge of said pan member; said roller means being attached to said upper surface of said pan member between said first and second side edges thereof.

4,230,247
COMBINATION FOLDABLE GOLF CLUB CARRIER AND SCORE KEEPING DEVICE
Gerald W. Lowe, 9330 Tropico Dr., La Mesa, Calif. 92041
Filed Jul. 7, 1978, Ser. No. 922,535
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.³ B65D *71/00*
U.S. Cl. 224—45 R **2 Claims**

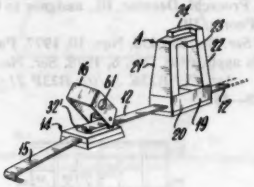


1. A device designed to relieve the golfer of inconveniences caused by unnecessarily heavy and bulky conventional golfing equipment; said device, which is easy to carry around golf courses and convenient to handle when transporting to and from the golf course, having structure consisting primarily of two identical A-frame assemblies containing a vertex block at each end with a hole to receive and secure by fasteners an extended dowel end of a handle, each of said vertex blocks having tapered sides, the tapered sides of said vertex blocks slip into aluminum legs and each vertex block held accurately by one fastener on which each of said legs can be pivoted from a 13 degree open angle, to an inward 0 degree closed position where said legs would lie parallel to each other, each of said legs secured theron approximately four thin spring steel gripper clips which are equally spaced vertically and aligned so that a horizontal positioning of golf clubs can be easily achieved and also so that said golf clubs may be securely held within said clips; the device further including a narrow tray which is connected to the bottom surfaces of said vertex blocks and serving as a short-legged structural channel stiffener for the device, two pieces of soft plastic tubing, each of proper length to hold two golf balls and being secured to said tray, with each said pieces of tubing being split in a straight line along the top, the sides of each of the splits being overlapped, thus resulting in a slight diameter reduction and causing a contracting action in order to retain golf balls when inserted therin; each of said split pieces of tubing normally extending longitudinally along said tray and being secured to said tray by centrally located fasteners which permit the pieces of tubing to be rotated to facilitate golf ball insertion and removal without interference with the said handle or the golf clubs.

4,230,248
SKI RACK
Robert J. Finnegan, Williston, Vt., assignor to Barreca Products Co., Inc., Shelburne, Vt.
Filed Mar. 15, 1979, Ser. No. 20,748
Int. Cl.³ B60R *9/04;* **B60P** *3/00*
U.S. Cl. 224—323 **11 Claims**

1. In a ski rack of the character indicated, comprising a frame with an elongate base and transversely spaced upstanding side walls connected by said base, a first post member mounted to said frame and extending generally perpendicularly above said frame, said post member including a vertical portion and an upper longitudinaly offset arm extending gener-

ally parallel to said base to define a ski-locating profile for a pair of edge-mounted skis with the combined width of said pair contained beneath said arm, and a second post member having a mounting portion mounted to said frame and between said walls at a mounting region longitudinally offset from said first post member, said second post member including a vertical portion extending generally perpendicularly to effectively close the ski-accommodating space beneath said arm, the improvement in which the mounting of at least one of said post members includes first and second longitudinally spaced transverse pins extending between said side walls and through first and second longitudinally spaced portions of the mounting region of said one post member, horizontally extending slot means in at least one of said mounting regions for establishing a pin-limited range of longitudinal displacement for said one post member, and generally vertically extending slot means accommodating one of said pins in the other of said mounting regions, whereby said one post member has both a limited range of longitudinal displaceability and a limited range of angular displaceability about the instantaneous axis of said other pin.

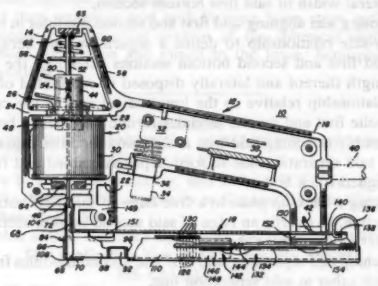


4,230,249

HAND-HELD FASTENER DRIVING TOOL

John R. Nasiatka, Northbrook; Ronald Austin, Hazelcrest, and Ernest F. Schaudek, Franklin Park, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Jul. 5, 1978, Ser. No. 921,979
Int. Cl.³ B25C *5/06*
U.S. Cl. 227—123 **34 Claims**



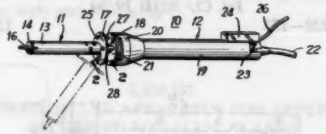
1. In a fastener driving tool of the type including a housing defining a handle portion and a head portion, a drive track defined in said head portion, a driver blade mounted in said drive track and means for reciprocating said blade in said track, the improvement comprising a plunger secured to said blade mounted in said head portion and reciprocated therein by said reciprocating means, one piece biasing means for biasing said plunger to an at rest position, said biasing means including a first portion of a first predetermined flexibility and a second portion of a second predetermined flexibility a workpiece engaging jaw removably secured to said head portion and defining a portion of said drive track, said jaw includes first and second workpiece engaging portions of different configurations for engaging different workpieces.

4,230,250

SOLDER EXTRACTOR

William E. Scheu, Jr., 22 Sedgemere Rd., Center Morchies, N.Y. 19934

Filed Apr. 30, 1979, Ser. No. 34,410
Int. Cl.³ B23K *3/02*
U.S. Cl. 228—20 **8 Claims**



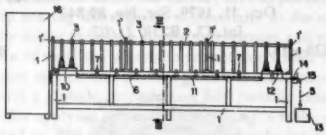
1. A solder extractor device comprising a rear section including a longitudinally extending hollow handle section housing a receiver receptable connectable to a suction source and having a front inlet opening, a front section including a bracket supporting a heater member engaging a forwardly projecting tubular tip member and a rearwardly extending coupling tube coupled to said tip member support means connecting said front section to the forward position of said rear section for swinging between a first position with the rear of said coupling tube in registry with said receiver inlet opening and a second position with the rear of said coupling tube out of registry with said inlet opening and means for releasably locking said front section in its first position.

4,230,251

AUTOMATIC APPARATUS FOR THE TREATMENT OF LINKS OF METALLIC CHAINS

Gustavo Braconi, 250 Ponte alla Chiassa, 52010 Arezzo, and Giuseppe Valli, 15 Via Tommaso Sgricci, 52100 Arezzo, both of Italy

Filed Jan. 2, 1979, Ser. No. 278
Claims priority, application Italy, Jan. 10, 1978, 47572 A/78
Int. Cl.³ B23K *1/14*; B21L *3/02*
U.S. Cl. 228—41 **6 Claims**



1. Automatic apparatus for the treatment of links of metallic chains, said apparatus comprising, in operative sequence: means for the automatic application, by shaking, of the soldering powder to one or more chains being treated; means for the automatic removal, by shaking, of the excess of the powder thus applied so that there remains, retained in the interstices of the individual links, only the quantity necessary for the subsequent soldering; and means for the automatic application, by shaking, of an isolating powder, such as talcum or the like, as to isolate the links one with respect to the other, said application and removal means comprising movable brackets shaking said chains and at the same time guiding them in a mixed

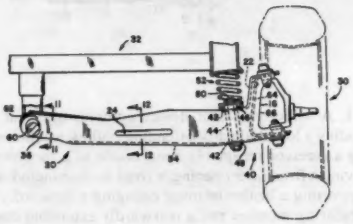
transversal and longitudinal movement in an almost horizontal plane.

4,230,252

METHOD FOR CONSTRUCTING A SUSPENSION MEMBER

Donald E. Meyer; James J. Colpaert, both of Granger; Frederick R. Fischer, South Bend; Michael E. Gatt, Osceola, and David P. Koehler, South Bend, all of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 25, 1978, Ser. No. 899,946
Int. Cl.³ B21D *39/00*
U.S. Cl. 228—152 **12 Claims**



1. A process for constructing a suspension member for a vehicle comprising in sequence the steps of:

(a) providing a single flat sheet;

(b) deforming said single flat sheet to form a pocket at one end of said single flat sheet, said pocket defining a predetermined width; and

(c) folding said single flat sheet to substantially define at first a middle section extending from the pocket to the other end, said middle section including a width substantially equal to said predetermined width and secondly a polygon cross section with said middle section forming a side of said polygon;

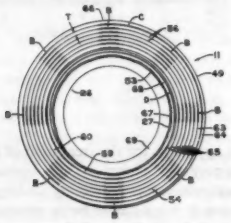
(d) said folding step imparting a curve to said middle section to offset the other end of said middle section from said pocket.

4,230,253

METHOD OF MAKING A CALIPER BRAKE ROTOR

John J. Enright, Troy, and William T. Holzworth, Springfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 950,491, Oct. 11, 1978. This application Oct. 31, 1979, Ser. No. 89,843
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—152 **4 Claims**



1. A method of making a rotor for a caliper brake comprising:

(1) wrapping an elongated steel strip in a coil to form a disc with a central opening and an outer periphery;

(2) welding the ends of said strip to said disc;

(3) adhering the overlapping surfaces of said coils together;

(4) machining the outer periphery and central opening to taper the ends of said strips and provide a uniform diameter of said central opening and of said outer periphery of the rotor; and

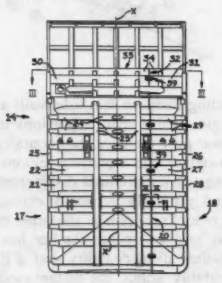
(5) welding said disc to a cylindrical adaptor for fastening said rotor to a wheel.

4,230,254

METHOD OF MAKING A MODULAR TRUCK BODY

Bernard E. Proeschl, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 850,433, Nov. 10, 1977, Pat. No. 4,162,096. This application Dec. 6, 1978, Ser. No. 966,841
Int. Cl.³ B23K *31/02;* **B23P** *21/00*
U.S. Cl. 228—182 **7 Claims**



1. A method for making a truck body disposed on a longitudinal axis thereof comprising the steps of

fabricating a unitary first module to have a generally L-shaped cross section defining a generally vertical first side section and a generally horizontal first bottom section,

fabricating a unitary second module to have a generally L-shaped cross section defining a generally vertical second side section and a generally horizontal second bottom section having a lateral width substantially less than the lateral width of said first bottom section,

disposing and aligning said first and second modules in side-by-side relationship to define a separation line between said first and second bottom sections extending the full length thereof and laterally disposed in substantial offset relationship relative to the longitudinal axis of the composite first and second modules forming said truck body,

releasably attaching said first and second modules together at said separation line to form a pre-assembled and fully aligned truck body,

securing a back-up plate to a free edge of said first bottom section, to overlie an edge of said second bottom section, after said attaching step,

detaching and separating said first and second modules from each other at said separation line,

shipping said separated first and second modules to a remote location,

again disposing and aligning said first and second modules in side-by-side relationship at said separation line while simultaneously guiding such alignment by overlapping said separation line with said back-up plate,

again releasably attaching said first and second modules together at said separation line, and

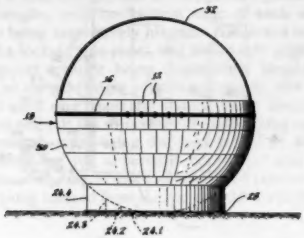
fixedly securing said first and second modules together at said separation line to form a structurally integrated truck body, including the step of welding said back-up plate to said first and second modules adjacent to said separation line.

4,230,255

PROTECTIVE SHELL FOR NUCLEAR REACTOR AND METHOD FOR ASSEMBLING THE SHELL

Leland E. Coulter, New Canaan, Conn., assignor to Teledyne, Inc., Los Angeles, Calif.

Division of Ser. No. 607,181, Aug. 25, 1975. This application Sep. 21, 1978, Ser. No. 944,266
Int. Cl.[2] E04G *11/04*
U.S. Cl. 228—184 10 Claims



1. The method of assembling a large hollow spherical shell for housing a nuclear reactor or the like comprising the steps of

forming a plurality of spherical segments to be assembled into the shell for enclosing a nuclear reactor or the like therein;

joining a first group of spherical segments comprising the lower hemispheric portion of the sphere to each other and to a support base;

assembling a hoop above the lower hemispheric portion, said hoop having an outer radius commensurate with that of the inner radius of said spherical shell;

temporarily securing a plurality of vertically oriented spherical segments to said hoop to form a first vertical arch extending along the desired shape of the shell from one side of the lower hemispheric portion to an opposite side;

joining said plurality of spherical segments to each other and to said lower hemispheric portion to form a first vertical self-supporting arch;

disengaging said hoop from said arch;

moving the hoop to an adjacent vertical support position and forming a second vertical arch of joined spherical steel segments in the same manner and joining said second to said adjacent first arch;

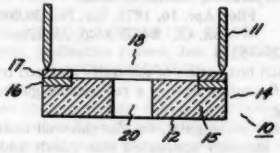
and then repeating said arch-forming hoop steps until the upper hemispherical portion of the spherical shell has been formed on and joined to the lower hemispherical portion.

4,230,256

METHOD OF BONDING A COMPOSITE BODY TO A METALLIC ELEMENT

Bruce S. Dunn, Schenectady, and Robert R. Dubin, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 808,813, Jun. 22, 1977, Pat. No. 4,142,945. This application Nov. 6, 1978, Ser. No. 958,039
Int. Cl.[3] B23K *20/00*
U.S. Cl. 228—193 6 Claims



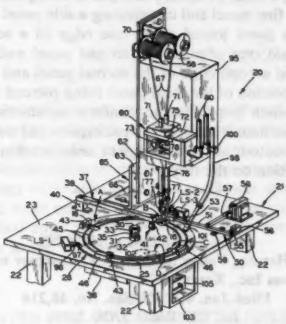
1. A method of bonding a composite body to a metallic element which comprises providing a composite body with opposite major surfaces and an edge surface, a solid ion-conductive electrolyte material, a surface portion of an ion-insulating material, and a deformable metallic element bonded to at least a portion of one major surface, providing a deformable metallic casing with an open end having a sharp edge, positioning the sharp edge of the open end of the casing against the deformable metallic element of the composite body, heating the composite body and casing in an inert atmosphere at temperature in the range of 300° to 600° C., and pressing the casing against the deformable metallic element in a range from 100 to 4,000 pounds per square inch to effect bonding between the composite body and the casing.

4,230,257

METHOD OF AND APPARATUS FOR APPLYING SOLDER TO METALLIC BLANKS

Charles W. Genson, Bowling Green, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Dec. 1, 1978, Ser. No. 965,603
Int. Cl.[3] B23K *1/02*
U.S. Cl. 228—244 10 Claims



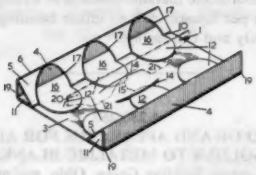
1. A method of applying solder to metallic blanks comprising: supporting a metallic blank in a substantially horizontal plane and moving the same bodily in a generally horizontal path successively through a series of operations, feeding an increment of a solid strip of solder against the blank by advancing said strip between a pair of feed wheels rotating in one direction, heating the blank and thereby an end portion of said solder strip bearing thereagainst substantially to the softening point of the solder to form a molten end portion, and reversing the rotation of said feed wheels to retract said solder strip and separate said molten end portion from the remainder of said strip to form a globule deposited on said metallic blank.

5. A solder applying apparatus comprising: a table, a turntable mounted on said table for holding and indexing a metallic blank in a substantially circular path successively through a series of work stations, a frame on said table, a supply of solder in strip form mounted on said frame, means on said frame above said table for intermittently feeding an increment of said solder strip against said blank at one of said work stations, means at said one work station for heating said blank and thereby said increment of solder strip via conduction through said blank substantially to the softening point of said solder to melt said solder increment onto said blank as an integral part thereof, said feeding means comprising a drive wheel and an idler wheel between which said solder strip extends, and means rotating said drive wheel in one direction to advance said strip against said blank and subsequently rotating said drive wheel in an opposite direction to retract said solder strip for severing the same from said molten increment of solder.

4,230,258
TRAY FOR A SHRINK-WRAP PACKAGE

Douglas C. Lane, Hyde, Nr. Manchester, England, assignor to Lancashire Box Company, Limited, Hyde, Nr. Manchester, England

Filed Jun. 25, 1979, Ser. No. 51,570
Claims priority, application United Kingdom, Jun. 28, 1978, 28193/78
Int. Cl.³ B65D 5/20, 71/08
U.S. Cl. 229—30 10 Claims

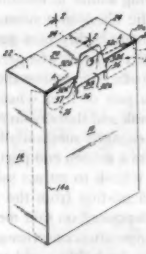


1. A tray erectable from a blank of sheet material and for use in a shrink-wrap package, the tray comprising a first panel constituting a base, a second panel joined along one edge to an edge of the first panel and constituting a side panel of the tray, and a third panel joined along one edge to a second edge opposing said one edge of the second panel and extending between said second edge of the second panel and the base of the tray, a portion of the third panel being pierced to expose a cut edge which is profiled to conform substantially with a contour of an item it is desired to package on the tray whereby in use said contour abuts said edge to assist in retention of said item in position on the tray.

4,230,259
SELF-LOCKING CARTONS

Milton W. Herzog, Valley Stream, N.Y., assignor to H. Goodman & Sons Inc., Kearny, N.J.

Filed Jun. 4, 1979, Ser. No. 45,214
Int. Cl.³ B65D 5/08, 5/06
U.S. Cl. 229—38 9 Claims

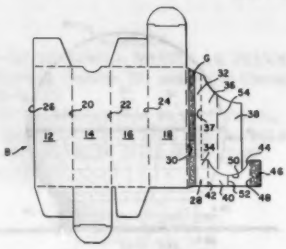


1. A hang-up carton having a body portion formed of plural walls including first and second walls, a top panel hinged to said first wall and forming a closure across said body portion, a flap extending from said top panel along the inside of said second wall, an incision through the second wall spaced from the top panel, and a hang-up tab secured to said flap by a hinged connection which forms a reverse bend extending through the incision when the hang-up tab is in use, said hang-up tab having a first portion disposed by said reverse bend generally along the outside of said second wall and said hang-up tab projecting above the top of said closure when the hang-up tab is in use, the projecting portion of the hang-up tab being apertured to admit a merchandise-suspending rod, the carton being proportioned so that said top panel faces upward when the carton depends from the hang-up tab.

4,230,260
FOLDABLE PROTECTIVE PACKAGING SLEEVE OR CARTON

Robert G. Kramer, Cincinnati, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Jul. 13, 1979, Ser. No. 57,527
Int. Cl.³ B65D 25/14, 5/58
U.S. Cl. 229—39 B 12 Claims



1. A foldable protective packaging sleeve or carton of paperboard material for an electronic tube or the like, wherein in the erected condition thereof said sleeve or carton comprises: two pairs of generally parallel panels, the panels of one of said pairs of panels constituting first and third side walls and the panels of the other of said pairs of panels constituting second and fourth side walls around said carton, said second, third, and fourth side walls extending successively from said first side wall along successive mutually parallel fold lines, said fourth side wall having an assembly panel integral therewith and extending beneath and adhered to an adjacent inside portion of said first side wall, said assembly panel including an elongate, relatively narrow band portion extending along said adjacent inside portion of said first side wall for substantially the entire length thereof and a short, relatively wide band portion disposed beneath and adhered to said adjacent inside portion of said first side wall at one end thereof, said relatively narrow band portion having a flexible cushioning flap integral therewith and extending from one edge thereof to a free or unattached edge toward said third side wall, said relatively wide band portion having a dome support member integral therewith and extending from one edge thereof to and adhered to an inside portion of said third side wall opposite from said first side wall whereby said dome support member extends from said first side wall to said third side wall adjacent one end of said carton and is secured at opposite ends thereof to said carton, said flexible cushioning flap being deflectable toward said one of said second and fourth side walls by one side of a tube inserted into said carton to minimize impact between the tube and any resistance which might be encountered on said one of said second and fourth side walls, said dome support member having a hinged projection along which it is adhered to said third side wall.

4,230,261
LUNCH BOX CARTON AND A BLANK FOR FORMING SAME

John J. Austin, Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,009
Int. Cl.³ B65D 5/46, 25/22
U.S. Cl. 229—52 B 16 Claims

1. A lunch box carton of generally inverted truncated pyramidal configuration having a recloseable gabled top portion comprising:

a generally rectangular, tubular sidewall including alternatively hingedly connected side panels and locking side panels, each of said side panels and said locking panels being tapered from the top edge to the bottom edge thereof, each said locking side panel including a generally

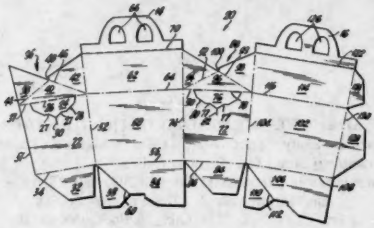
triangular cut-out portion disposed at the upper edge thereof;

a bottom panel hingedly connected to said sidewall;

two top panels, each respectively hingedly connected along a bottom edge thereof to the top edge of a side panel;

a handle hingedly connected to the top edge of each top panel; and

two locking top panels, each being formed from three hingedly connected triangular sections, said sections including a base triangle and two opposed equilateral support triangles, with the bottom edge of each said base triangle being respectively hingedly connected to the top edge of a locking side panel, and with a side edge of each said support triangle being respectively hingedly connected to the side edges of said top panels, and with an apex of each said triangular section being disposed at a common point at the top center of said locking top panel, said common point being disposed below an imaginary line connecting the uppermost corners of said support triangles, with each of said top panels and said locking top panels being tapered from the top edge to the bottom edge



thereof such that the open configuration of said carton defines a generally inverted truncated pyramidal configuration to enable stacked nesting of a plurality of cartons whereby, in the closed condition of the carton, the upper edges of said top panels are in abutting relationship forming a gabled configuration, the handles extend above said gabled top portion, and each locking top panel is folded so as to be disposed in coplanar relationship with the associated locking side panel, with the upper end of each said locking top panel extending above the plane defined by the top edges of said side panels, such that said locking top panels function to maintain said top panels in the gabled configuration, and with the lower end of each said locking top panel defining a generally triangular locking tab of greater cross-sectional area than the cross-sectional area of the cut-out portion in the associated locking side panel, with each said triangular locking tab being interengaged with the associated locking side panel by having a portion thereof extending through said cut-out portion internally of said locking side panel for maintaining said gabled top portion in a locked position.

4,230,262

CONTINUOUS STRIP OF SEALED ENVELOPES WITH INNER DOCUMENTS

Andre M. J. Denay, Chevilly Larue, and Pierre M. J. Bouge, Paris, both of France, assignors to Herve et Fils, S.A., Paris, France

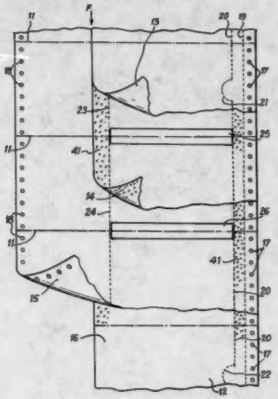
Filed Jan. 19, 1978, Ser. No. 870,783

Claims priority, application France, Jan. 26, 1977, 77 02163

Int. Cl.[3] B65D *27/10*

U.S. Cl. 229—69 **4 Claims**

1. A complex continuous strip folded accordion-wise into a plurality of successive flaps of which each flap constitutes a correspondence envelope comprising a plurality of continuous sheets laterally joined together, said plurality of sheets including an upper sheet constituting the front wall of successive envelopes, a lower sheet constituting the back wall of said envelopes, and at least one intermediate sheet constituting an inner document having an outer marginal edge portion, said intermediate sheet adhesively secured to said upper and lower sheets, said complex strip being provided on each of its lateral sides with drive perforations situated in a marginal zone, said inner document having said outer marginal edge portion extending to the outside of the sealed envelopes of the strip in



order to detect its presence and identity, said outer marginal edge portion of said inner document also being provided with said drive performations, said at least one intermediate sheet, which constitutes said inner document whose presence must be checked, being wider than the upper and lower sheets so as to provide said outer marginal edge portion along one side, said outer marginal edge portion having a length corresponding substantially to the length of said envelope.

4,230,263

APPARATUS FOR ACCOMPLISHING UNLIMITED RELATIVE ROTATION OF THE ENDS OF A FILIFORM TRANSMISSION ELEMENT

Johan E. H. Westberg, Lidingö, Sweden, assignor to Separex Teknik AB, Stockholm, Sweden

Filed Aug. 2, 1978, Ser. No. 930,389

Claims priority, application Sweden, Aug. 3, 1977, 7708858

Int. Cl.[2] B04B *9/00*

U.S. Cl. 233—23 R **13 Claims**

1. Apparatus for accomplishing unlimited unidirectional relative rotation of the ends of a filiform, flexible transmission element, comprising:

a base,

a first rotor which is rotatable relative to the base about a first axis (A1),

a second rotor which is rotatable relative to the first rotor and the base about a second axis (A3), said second axis being substantially parallel to the first axis,

a third rotor which is rotatable relative to the base and the first and the second rotors about a third axis (A2) substantially parallel to the first and second axes (A1, A3), and

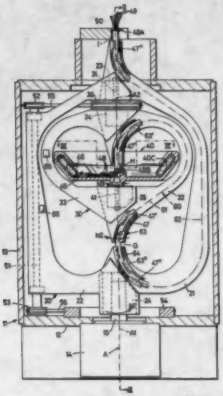
drive means operable to rotate the first and third rotors in opposite directions relative to the base and to rotate the second rotor in the same direction as the third rotor at a rotational speed (N3) equal to twice the sum of the rotational speeds (N1, N2) of the first and third rotors,

first fastening means for non-rotatably fastening one end of the transmission element to the base near the first axis (A1),

second fastening means for non-rotatably fastening the other end of the transmission element to the second rotor near the second axis (A3),

means for holding a first length of the transmission element in position on the first rotor along a bight line extending from a point (I) near the first fastening means out around the region occupied by the second rotor and back to a point (G) near the first axis (A1), the ends of the bight line pointing in the same direction,

means for holding a second length of the transmission element in position on the third rotor along a second bight



line having its ends pointing in the same direction and forming a continuation of the first bight line, said second bight line at one end thereof (H) extending from the second rotor near the second fastening means and out around the region occupied by the second rotor inwardly of the first bight line and back to a point (G) near the third axis (A2) where it merges with the first bight line,

the transmission element being rotatable relative to the first and second rotors in said holding means.

4,230,264

METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION OF COMPONENTS OF SOLUTION

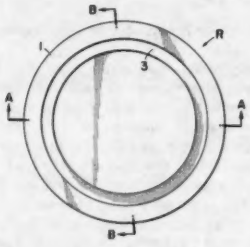
Tetsuo Matsumoto, Hyogo, Japan, assignor to Akira Okumura, Hyogo; Shigemitsu Yamada, Tokyo and Fumiko Uozumi, Hyogo, all of, Japan

Filed Feb. 16, 1979, Ser. No. 12,819

Claims priority, application Japan, Feb. 17, 1978, 53/17909; Sep. 29, 1978, 53/121065

Int. Cl.³ B04B *11/06*

U.S. Cl. 233—27 **4 Claims**



1. A method for centrifugal separation of components of a solution, using a centrifugal rotor including a hollow body having at least two annular peripheral grooves formed in the inside thereof with a suitable distance held therebetween and a series of depressions formed in the inside wall of said rotor body, in which one of said annular grooves and the depression at one end of said series are communicated with each other and the other of the annular grooves and the depression at the other end of said series are communicated with each other, while the respective adjacent depressions are communicated with each other but the depressions at said one end and said other end of said series are not communicated, said method comprising injecting the solution into one of said annular grooves, moving the solution successively through the respective depressions, under the centrifugal effect of the rotor, while subjecting the components of the solution to the centrifugal separation, making the separated precipitate component to deposit in the depressions and discharging the subnatant component from the other annular groove.

4,230,265

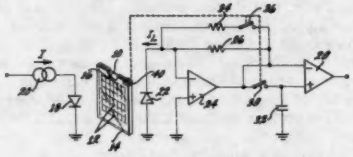
ADAPTIVE THRESHOLD OPTICAL READER

Richard J. Casaly, Santa Monica, Calif., assignor to Transaction Technology, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 943,201, Sep. 18, 1978. This application May 7, 1979, Ser. No. 36,686

Int. Cl.³ G06K *7/14*; G08C *9/06*; G06K *9/00*

U.S. Cl. 235—455 **21 Claims**



1. An adaptive threshold optical reader for detecting optically encoded information when positioned within an optical path, including

a light source for producing light energy along the optical path,

a light detector responsive to the light energy along the optical path and for producing an output signal in accordance with the light energy detected by the light detector,

means responsive to the output signal from the light detector and with the means having at least two states and with the means in a first state producing an adaptive threshold signal when there is no optically encoded information positioned within the optical path and with the adaptive threshold signal representative of the output signal from the light detector with a threshold level of optically encoded information and adaptive to optical changes and with the means in a second state for producing an information signal representative of the output signal from the light detector when there is optically encoded information positioned within the optical path,

means responsive to the adaptive threshold signal for storing the adaptive threshold signal, and

means responsive to the stored adaptive threshold signal and the information signal for detecting the presence of optically encoded information in the information signal above a threshold level in accordance with the stored adaptive threshold signal.

4,230,266

METHOD AND APPARATUS OF CAVITY IDENTIFICATION OF MOLD OF ORIGIN OF A GLASS CONTAINER

John W. Juvinall, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 864,080, Dec. 23, 1977. This application Apr. 25, 1979, Ser. No. 33,080
Int. Cl.[3] G06K *19/06*; G01V *9/04*
U.S. Cl. 235—490 5 Claims

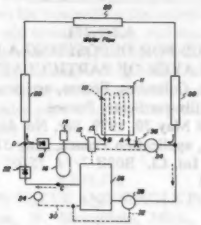
1. A glass container with an integrally molded concentric ring code, said code being defined by the presence or absence of rings within possible ring positions, and with the limitation that no two rings occupy adjacent possible ring positions.

4,230,267

HEATING SYSTEM FOR BUILDING STRUCTURES

Anton A. Dotschkal, and James J. Massaro, both of Newark, N.Y., assignors to Irvine Enterprises Inc., Sodus, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,293
Int. Cl.[3] F24B *9/04*
U.S. Cl. 236—9 A 10 Claims



1. A heating system for a building structure comprising in combination:

a. a first heating unit comprising an enclosed natural fuel burning device;

b. a heat exchange member having an inlet and an outlet for a heating medium situated within said enclosed natural fuel burning device;

c. a first pumping means in fluid conducting relationship with the inlet of said heat exchange member;

d. first control means for sensing the temperature of the heating medium at the outlet of said heat exchange member and for activating and deactivating said first pumping means responsive to the sensed temperature;

e. a first flow control means in fluid conducting relationship with the outlet of said heat exchange member for controlling the direction of flow of the heating medium;

f. a second heating unit having an inlet and outlet for heating said medium;

g. second pumping means in fluid conducting relationship with the inlet of said second heating unit;

h. second control means for sensing the ambient temperature within the building structure and activating or deactivating said second heating unit and said second pumping means responsive to the sensed temperature;

i. second flow control means in fluid conducting relationship with the outlet of said second heating unit for controlling the direction of flow of the heating medium; and

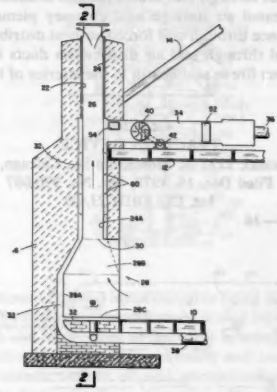
j. heat radiation means in fluid conducting relationship with said first and second flow control means and said first and second pumping means.

4,230,268

FORCED AIR FIREPLACE FURNACE

Ralph E. Gorman, R.R. 4, Siloam Springs, Ark. 72761, and Robert W. Bruce, Rte. 4, Fairfield, Ill. 62837

Continuation of Ser. No. 658,262, Feb. 17, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,944
Int. Cl.[3] F24B *7/00*
U.S. Cl. 237—51 1 Claim



1. A heating system for a building having a floor, a roof, a horizontal ceiling below the roof, and an attic between the ceiling and the roof comprising:

a fireplace supported on the floor having a hearth open in front;

a vertical chimney extending from the upper portion of the hearth, passing through the building ceiling and attic and communicating with the building exterior and terminating above the building roof;

a metal firebox positioned in the hearth in spaced relation therewith, the firebox being open in the front and closed on the sides, the back and bottom, and having an opening in the top;

a hearth plenum chamber formed by the spaced relation of said hearth and said metal firebox, the plenum chamber surrounding the sides, back and top of said metal firebox;

a vertical flue liner of heat conducting metal within said chimney affixed at its lower end to said opening in the top of said metal firebox, the flue liner being of sufficient height to pass through the building ceiling and at least prt way through the building attic, the upper end of the flue liner communicating with the upper end of said chimney whereby smoke produced by combustion of consumable fuel in said firebox is conducted to the exterior of the building, the exterior dimensions of the flue liner being less than the interior dimensions of said chimney providing a vertical chimney plenum chamber, the lower end of the chimney plenum chamber communicating with the upper end of the hearth plenum chamber, the chimney plenum chamber extending at least partially within the building attic;

an elongated horizontal forced air heat distributing chamber positioned in the building attic above the ceiling and

below the roof and having communication within the attic at one end with said vertical chimney plenum chamber;

a plurality of air distribution ducts connected to the other end of said heat distributing chamber for conducting air to selected places of discharge in the building;

a motor driven fan positioned in said horizontal forced air heat distributing chamber;

at least one return air duct extending from a selected place in the building and communicating with the lower portion of said hearth plenum chamber whereby return air from said selected place is recycled to the hearth plenum chamber;

said plenum chamber includes a portion below the bottom of said hearth firebox and

said return air duct extends horizontally below the building floor and communicates upwardly with the lower portion of said hearth plenum chamber

whereby said fan, when energized, draws air from said return duct through said hearth plenum chamber and circulates heated air through said chimney plenum chamber and thence through said forced air heat distributing chamber, and through said air distribution ducts to distribute heat from fire in said hearth to the interior of the building.

4,230,269

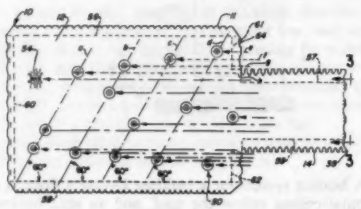
TRACTION DEVICE

Joseph Uchanski, 2222 N. Monticello St., Chicago, Ill. 60647

Filed Dec. 15, 1978, Ser. No. 970,087

Int. Cl.³ E01B *23/00*

U.S. Cl. 238—14 **10 Claims**



1. A device for improving traction underneath a slipping wheel of a vehicle disabled on a slippery road surface, comprising a body of substantially rectangular sheet of expanded metal sheet, and an elongated tongue extending from one of the transverse edges of said sheet to initiate interengagement between the surface of said slipping wheel and said road surface, said body including a plurality of randomly spaced protrusions, each being located along an individual line parallel to the longitudinal axis of said body, each line being spaced from an adjoining line by a distance which is at least equal to the width of the protrusion, said sheet having a wheel engaging surface and a road engaging surface.

4,230,270

MULTINOZZLE BLOCK FOR SPRAYING TOOL SURFACES

Henri Poret, Cleon, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Continuation-in-part of Ser. No. 749,098, Dec. 9, 1976, abandoned. This application Nov. 9, 1978, Ser. No. 959,019

Claims priority, application France, Dec. 9, 1975, 75 37545

Int. Cl.³ B22D *17/20*; F16N *11/00*

U.S. Cl. 239—67 **4 Claims**

1. A multinozzle block for spraying the surfaces of tools, said block being traversed by first and second passages for supplying spray materials and spraying air, respectively,

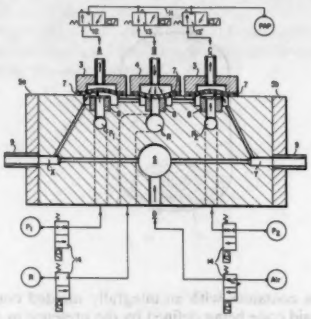
a group of valves disposed on at least one of the faces of said block;

elastic obturating membranes being disposed in each of said valves,

outlets for spraying air and materials in said block connected to said first and second passages

pneumatic logic control means for putting said first and second passages in programmed fluidic communication with said outlets for spraying air and materials through operation of said obturating membranes of said valves,

nozzles grouped on at least one of the other faces of said



block and communicating with respective outlets for spraying air and materials, and

means for purging and washing said first and second passages comprising a built-in rinsing system having a rinsing liquid supply passage separate from said first and second passages in programmed fluidic communication with said passages by at least one of said valves with an elastic obturating membrane and communicating via at least one other valve of said valves with an elastic obturating membrane, under pneumatic logic control, with said passages.

4,230,271

APPARATUS FOR DEPOSITING A UNIFORM THICKNESS LAYER OF PARTICULATE MATERIAL

Jeannik Marcault, Colombes, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 30, 1979, Ser. No. 43,655

Claims priority, application France, May 31, 1978, 78 16272

Int. Cl.³ B05B *7/14, 15/02*

U.S. Cl. 239—113 **10 Claims**

1. Apparatus for depositing in an even and uniform layer a particulate material on a substrate, said apparatus including

(a) a housing including a longitudinal exit slit, and

(b) means for moving said particulate as a gaseous suspension to said exit slit, said means including

(1) a chamber in said housing,

(2) a main conduit into which said suspension is received, and

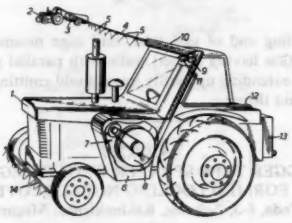
(3) a plurality of secondary conduits, dividing from one end of said main conduit, and each said secondary conduit being of equal length and internal diameter with the other end connected to said chamber within a length coextensive with said exit slit and at equally spaced intervals therealong.

4,230,272

CROP SPRAYING APPARATUS

Thomas B. Snell, Hill View, Penn La., Hardington Mandeville, Yeovil, Somerset, England

Filed Jun. 6, 1978, Ser. No. 913,158
Int. Cl.[2] A01G *25/02*
U.S. Cl. 239—121 **12 Claims**



1. Spraying apparatus comprising a flexible pipe equipped with spray issuing means at intervals along at least some of its length, a storage device for such a pipe including a pulley assembly having two sets of pulley wheels in an arrangement equivalent to a multifold purchase, the two sets being relatively movable to pay out or take in the pipe which is passed around the pulleys wheels, means for suspending the pipe clear of the ground, means for controlling the extent of pipe paid out from or taken into said storage device, and means for pumping spray medium along at least the paid out portion of said pipe in use of the apparatus, the suspending means including, at one end of the pipe at least, a vehicle movable transversely to the length of the suspended pipe whereby the ground can be swept by the spray medium

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4,230,273

FUEL INJECTION VALVE AND SINGLE POINT SYSTEM

William B. Claxton, W. Bloomfield, Mich., and Joseph C. Cromas, Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 7, 1978, Ser. No. 875,828
Int. Cl.[2] F02M *51/08, 61/06, 61/14*
U.S. Cl. 239—125 **10 Claims**

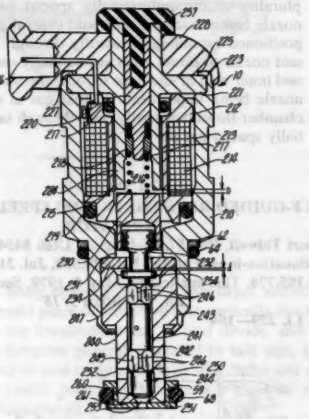
1. A fuel metering assembly including a rapid substitution injection valve for single point and multipoint fuel injection systems, said valve assembly comprising;

an independently formed injector jacket having a fuel inlet passage for receiving pressurized fuel and for communicating said fuel to an accumulation chamber defined by an inside wall of said fuel injection jacket; said injector jacket further having a fuel exit passage directly connected to the accumulation chamber for communicating said fuel from the accumulation chamber, the inlet and exit fuel passages supplying said accumulation chamber with a circulating quantity of fuel under a substantially constant pressure;

a rapid substitution injection valve including a solenoid and armature which are operably enabled by electronic control signals to the solenoid to produce relative movement between said armature and solenoid;

a needle valve slideably reciprocable in a bore of a valve housing and having a valve tip that seals a metering orifice located at one end of the valve housing, said needle valve afixed to said armature such that the control signals will open and close the metering orifice;

at least one inlet orifice formed in the valve housing and disposed such that said inlet orifice is proximate to the valve tip and metering orifice, said proximity causing the inlet orifice to provide substantially no restriction to a metered fuel flow through the inlet orifice to the metering orifice;



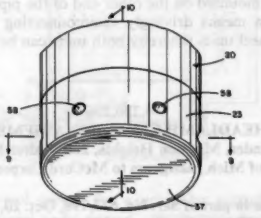
said valve housing of said injection valve being inserted into a pair of mounting apertures formed in said injector jacket such that said inlet orifice of the valve housing communicates with said accumulation chamber and said metering orifice extends outside of said accumulation chamber, means for hydraulically sealing said valve housing and said accumulation chamber from fuel leakage.

4,230,274

LANCE FOR REMOVING SKULLS FROM STEELMAKING VESSELS

Nicholas M. Rymarchyk, Wexford, and Leo L. Meinert, Baden, both of Pa., assignors to Pullman Berry Company, Harmony, Pa.

Filed Jul. 10, 1978, Ser. No. 922,943
Int. Cl.[2] C21C *5/32*
U.S. Cl. 239—132.3 **9 Claims**



1. For use with a metal refining vessel having a hearth portion adapted to contain a molten metal charge and a nose section thereabove containing an opening through which the vessel is charged, the improvement of a lance extending through said opening for injecting an oxidizing gas from said lance against an inner wall of said nose section to prevent and remove nose skull build up comprising:

an outer pipe assembly,

an inner pipe assembly, and

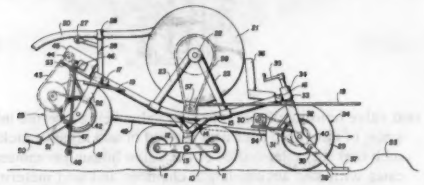
an intermediate pipe assembly,
said assemblies being interconnected to provide a central gas conduit, and water inlet and outlet passages,
a nozzle including a bottom and associated side wall extending generally upwardly therefrom, said nozzle being connected to said pipe assemblies including a central gas chamber communicating with said gas conduit,
a by-pass chamber in said nozzle communicating with said water outlet and inlet passages, and
a plurality of circumferentially spaced gas ports in said nozzle communicating with said central gas chamber and positioned extending outwardly through the side wall of said nozzle to direct a gas substantially outwardly against said inner wall of said nose section, the bottom wall of said nozzle being imperforate so that gas in said central gas chamber flows outwardly only through said circumferentially spaced gas ports.

4,230,275

SELF-GUIDED REVERSIBLE TWO SPEED ROW CROP IRRIGATOR

Hubert Tidwell, Box 57, Wellington, Utah 84542

Continuation-in-part of Ser. No. 929,550, Jul. 31, 1978, Pat. No. 4,185,774. This application May 4, 1979, Ser. No. 36,065
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—184 **8 Claims**



1. A row crop irrigator comprising a wheeled carriage having a fulcrum, a piping frame rockably supported on the fulcrum and extending fore and aft thereof, a hose reel mounted upon the piping frame above the fulcrum and being rockable with the piping frame and including tubular supports communicating with the interior of the piping frame whereby a hose coiled on said reel may deliver irrigation water through said supports to the interior of the piping frame, fore and aft transverse irrigation booms on the piping frame near the front and rear thereof and on opposite sides of the wheeled carriage, a slow speed powered traction wheel unit bodily mounted on one end of the piping frame and including a ground-engaging reversing element, and a higher speed powered traction wheel unit bodily mounted on the other end of the piping frame, and transmission means drivingly interconnecting said powered traction wheel units whereby both units can be driven at said slow speed.

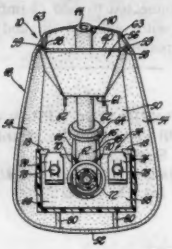
4,230,276

HEADLAMP CLEANING ASSEMBLY

David V. Tinder, Madison Heights, and Walter E. Mack, Livonia, both of Mich., assignors to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 623,798, Oct. 20, 1975, Pat. No. 4,026,473. This application Jul. 27, 1976, Ser. No. 708,932
Int. Cl.³ B05B *1/10, 3/14;* B08B *3/02*
U.S. Cl. 239—229 **20 Claims**

1. An assembly for directing fluid toward a surface comprising; a flexible tube having an emitting first end for emitting fluid and for flailing in response to such emission of fluid from said emitting end and an anchored second end, cage means defining an opening surrounding said emitting end of said tube and in spaced relationship thereto for restricting the flailing movement of said tube, said cage means defining a throat spaced from and between said anchored end of said tube and said emitting end of said tube so that said cage means diverges from said throat whereby the flailing movement of said tube is more restricted between said throat and said anchored end than between said throat and said opening which surrounds



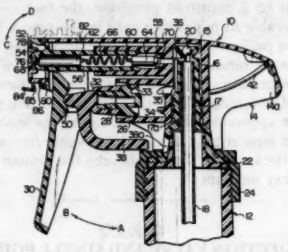
said emitting end of said tube, said cage means including a cross section having spaced walls with parallel portions in a direction extending upwardly toward said emitting end of said tube to said throat.

4,230,277

TRIGGER TYPE SPRAYER WITH INTEGRALLY FORMED LOCKING NOZZLE COVER

Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan

Division of Ser. No. 841,572, Oct. 12, 1977, Pat. No. 4,153,203. This application Dec. 4, 1978, Ser. No. 966,022
Int. Cl.³ B05B *9/043*
U.S. Cl. 239—333 **22 Claims**



1. In a trigger type sprayer which comprises a sprayer body provided with a cylinder through which a piston slides, and engaged with a liquid container; a trigger rotatably coupled to said sprayer body; a nozzle on said sprayer body, said nozzle having an ejection hole at an end portion thereof to eject a liquid spray and spring means coupled to said trigger for urging said trigger outward;
the improvement wherein said sprayer further comprises:
a nozzle cover integrally formed with said nozzle and connected to said nozzle through an integral hinge, said nozzle cover having a free end opposite said integral hinge and said nozzle cover including a seal section located intermediate said integral hinge and said free end of said nozzle cover for sealing said ejection hole of said nozzle in liquid-tightness by abutment against said ejection hole;
an engagement section formed in said nozzle;
a first lock section formed at the free end of said nozzle cover and which includes means for snap-fit engagement in said engagement section in said nozzle, said first lock section, when snap-fitted in said engagement section of said nozzle, locking said nozzle cover in said nozzle with said seal section in sealing abutment with said ejection hole;

an engagement hole formed in the upper surface of said sprayer body; and

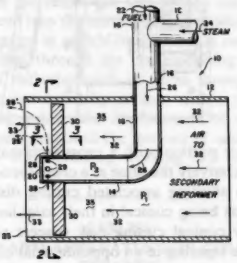
a second lock section formed in said nozzle cover and which includes means for snap-fit engagement in said engagement hole in said upper surface of said sprayer body, said second locking section, when snap-fitted in said engagement hole, locking said nozzle cover to said sprayer body.

4,230,278

APPARATUS FOR REDUCING HYDROCARBON FUEL REQUIREMENT FOR HABER AMMONIA SYNTHESIS

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Oct. 23, 1978, Ser. No. 953,486
Int. Cl.³ B05B *7/06*; C01C *1/04*
U.S. Cl. 239—427.5 **4 Claims**



1. Apparatus for supply of gases to a secondary reformer of a HABER ammonia system, to reduce total hydrocarbon fuel requirement, comprising;

(a) a first cylindrical conduit of diameter D1;

(b) a second cylindrical conduit of diameter D2, less than D1, coaxial with and inside of said first conduit, forming a first annular space therebetween;

(c) the downstream end of said second conduit closed and a plurality of circumferentially-spaced orifices of diameter K1 in the second conduit wall upstream of said closed end;

(d) means to conduct a flow of air to said first conduit and at a selected pressure P1, temperature, and flow rate through said first annular space;

(e) means for conducting a combustible fuel, such as methane or natural gas, at a pressure P2 greater than P1, to flow through said second conduit, and through said orifices, at a flow rate such that the resulting concentration of methane or natural gas in the air in said first annular space will be less than the lower explosive limit; and

(f) including means to obstruct said air flow within said first annulus away from the radial flow path of said combustible fuel from said circumferentially-spaced orifices by a plurality of circumferentially-spaced radial bars attached to the outer surface of said second conduit upstream of said orifices and extending from the outer surface of said second conduit substantially to the inner surface of said first conduit, each of said bars aligned with one orifice;

whereby fuel from said orifices can, in the shadow of said radial bars, progress substantially across said first annular space, thus providing a more uniform mixture of fuel and air.

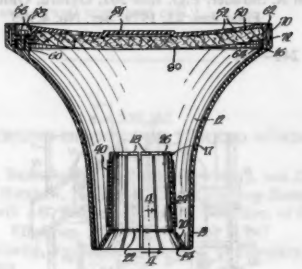
4,230,279

HAIR DRYER ATTACHMENT

John R. Forsberg, Arlington Heights, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 8, 1979, Ser. No. 46,622
Int. Cl.³ A45D *20/12*
U.S. Cl. 239—559 **6 Claims**

1. A hair dryer attachment device for spreading and reducing the velocity of an air stream emitted from a hair dryer nozzle comprising a generally diverging, substantially hollow body portion leading from an open, narrower inlet end to a wider, open outlet end, means for attaching said device to a hair dryer connected to and extending inwardly from said inlet end and affixed to an area adjacent to said inlet end, said attaching means comprising a plurality of flexible fingers, said



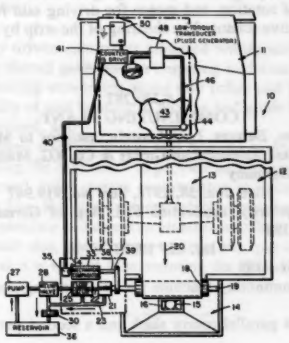
flexible fingers being biased to grasp a hair dryer nozzle and extending from said place of affixation first generally inwardly and oblique to the longitudinal axis of said device, and then extending in a direction generally parallel to said axis, and a face plate affixed to said body portion at said outlet end comprising a solid center portion and defining a plurality of air stream exit diffusing means.

4,230,280

VEHICULAR SPREADER WITH DIGITAL ELECTRONIC GROUND SPEED LINK

Theodore M. Leigh, Cedar Rapids, and James L. Rawson, Atkins, both of Iowa, assignors to Highway Equipment Company, Cedar Rapids, Iowa

Filed Dec. 11, 1978, Ser. No. 968,376
Int. Cl.³ A01C *19/00*; E01C *19/20*
U.S. Cl. 239—677 **11 Claims**



1. In a control system for a vehicular spreader having a source of material to be spread, distribution means, delivery means for delivering material from said source to said distribution means and power means for actuating said delivery means, the improvement comprising: low-torque transducer means sensing the ground speed of said vehicle for generating a train of electrical pulses having a repetition rate representative of the ground speed of said vehicle; stepper motor means actuated by said train of electrical pulses; comparator means responsive to the angular velocity of said stepper motor means and said power means for generating an error signal representative of the difference between the speed of said delivery

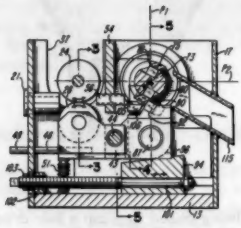
means and the speed of said vehicle; and control means responsive to said error signal for controlling the speed of said power means to track the speed of said vehicle.

4,230,281

SCRAP CHOPPER

Herbert M. Hill, 5801 Lathrop Pl., Cincinnati, Ohio 45239, and Donald R. Shrader, P.O. Box 301, Oxford, Ohio 45056

Filed Jan. 22, 1979, Ser. No. 4,995
Int. Cl.³ B02C *13/06, 18/06*
U.S. Cl. 241—142 **19 Claims**



1. A scrap chopper adapted to receive a narrow strip of scrap metal being fed from a slitting machine, said chopper comprising means for directing the strip along a predetermined path, a stationary cutting bar having a substantially straight cutting edge, a rotor including a rotary cutting bar having a substantially straight cutting edge, means supporting said rotor for rotation on an axis to orbit said rotary cutting bar adjacent said path, means supporting said stationary cutting bar adjacent said path and with its corresponding said cutting edge forming an acute angle with respect to each of two perpendicular reference planes including said axis of rotation, said rotor having means positioning said rotary cutting bar with its corresponding said cutting edge extending at an acute angle with respect to each of two perpendicular reference planes including said axis of rotation, each of said cutting edges having a non-uniform progressively changing radius with respect to said axis of rotation, and means for driving said rotor to produce effective scissors-like shearing of the strip by said cutting edges.

4,230,282

COMMINUTING PLANT

Egon Haase, Balzers, Liechtenstein, assignor to MOCO Maschinen- und Apparatebau GmbH & Co. KG, Mannheim, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,947
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730188
Int. Cl.³ B02C *18/06*
U.S. Cl. 241—159 **9 Claims**

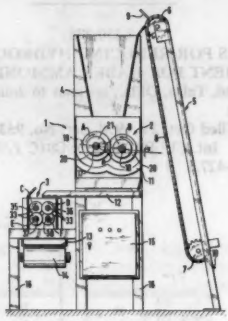
1. A comminuting machine for comminuting material comprising:

(a) a first parallel rotary shaft and a second parallel rotary shaft;

(b) means for rotating said parallel rotary shafts in opposite directions;

(c) a plurality of cutting disks disposed on said first and second parallel shafts, said cutting disks each being provided on both peripheral edges thereof with a plurality of spaced apart, arcuate cutting edges, said arcuate cutting edges having a circumferential length corresponding to a central angle of between 20° and 80°; and

(d) a plurality of cutting disk spacers removably disposed alternately with said cutting disks on said parallel shafts so that said spacers rotate with said shafts, said cutting disk spacers having a diameter smaller than a diameter of the cutting disks, said cutting disks on said parallel shafts being allocated to each other in pairs only, and upon rotation, touch each other on a corresponding, peripheral, arcuate cutting edge surface when in register and adjacent to each other, said cutting disk spacers having portions defining a space therebetween for the passage of comminuted material, said cutting disk spacers being provided on



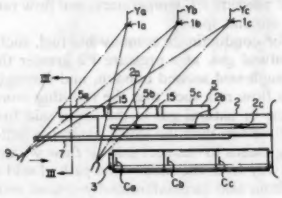
an end face portion with a cross-sectional configuration which is relatively the same as a cross-sectional configuration of an abutting associated cutting disk, said cutting disk spacers being conical in their axial length, and complimentary conical cutting disk spacers on said parallel shafts each tapering in an opposite axial direction.

4,230,283

YARN-INTRODUCING AND TAKE-UP DEVICE APPLIED TO A WINDING MACHINE

Masayoshi Hamaguchi; Hiroshi Watanabe, both of Otsu, and Itaru Hasegawa, Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,296
Claims priority, application Japan, Dec. 12, 1977, 52/148216
Int. Cl.³ B65H *54/02, 54/20*
U.S. Cl. 242—18 PW **7 Claims**



1. A yarn-introducing and taking-up device attached to a winding machine provided with a common bobbin holder for mounting a plurality of bobbins thereon at respective winding positions, a traverse mechanism provided with a plurality of working units arranged at respective positions corresponding to said winding positions respectively, each of said working units provided with a traverse guide, a plurality of fulcrum yarn guides disposed at respective positions above said traverse mechanism, said traverse mechanism located at a position between said common bobbin holder and said fulcrum yarn guides, means for driving said bobbins mounted on said common bobbin holder, means for collecting a plurality of yarns fed via the respective fulcrum yarn guides, said collecting means being capable of being displaced along a longitudinal axis of said common bobbin holder from an outside position of a free end of said common bobbin holder toward a supporting side of said common bobbin holder, yarn catching slits for

holding yarns fed from the respective fulcrum yarn guides on the respective bobbins mounted on said common bobbin holder, said device comprising a yarn-introducing guide disposed at a position between said group of fulcrum yarn guides and said traverse mechanism, said yarn-introducing guide comprising a plurality of guide units aligned in a row parallel to the axis of said common bobbin holder, with a slit between two adjacent guide units, each of said guide units provided with a sliding surface adapted to permit yarn to slide thereover while projecting the path of said yarn forward from an imaginary plane passing guide points of said fulcrum yarn guides and said traverse guides, said guide units arranged at respective positions satisfying the condition that, when said collecting means collects yarns fed via said fulcrum yarn guides and is displaced from said outside position toward said supporting side of said common bobbin holder, said yarns are capable of passing through the respective slits one by one so that each yarn is introduced into the corresponding working unit of said traverse mechanism in such a condition that only one yarn is capable of passing through the corresponding slit while the free passage of the other yarn or yarns through said corresponding slit is prevented by contact with a portion of said yarn-introducing guide, said displacement of said collecting means being continued until the last one of said yarn is introduced into the corresponding working unit of said traverse mechanism.

4,230,284

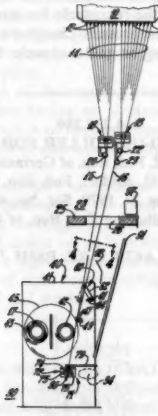
METHOD AND APPARATUS FOR COLLECTING STRANDS

Cecil R. Cunningham, Anderson; Ray M. Fulmer, and Gordon E. Cherry, both of Aiken, all of S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 11, 1979, Ser. No. 56,653

Int. Cl.³ B65H *54/02, 67/04*

U.S. Cl. 242—18 G **16 Claims**



1. Apparatus for the initiation of collection of a strand comprising:

a rotatable collet having a package collection region and a temporary collection region associated with a strand engagement section;

a pair of rolls adapted to advance said strand when said strand is not being collected on said collet, said rolls being spaced from said collet, said rolls and said collet being oriented such that said strand is advanced along a path immediately adjacent said strand engagement section when said strand is advanced by said rolls;

a movable member adapted to move said strand from a first zone spaced from said collet and said rolls to a second zone adjacent said rolls;

nozzle means for directing a stream of fluid into said second zone to move said strand into contact with said rolls to initiate the advancement of said strand by said rolls; and

actuator means for moving said strand advancing along said path into said strand engagement section to initiate collection of said strand upon said collet.

4,230,285

TRAVERSING DEVICE FOR THREAD WINDING APPARATUS

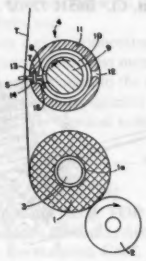
Erich Lenk, Remscheid, Fed. Rep. of Germany, and Donald J. Dobbins, Waxhaw, N.C., assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,047

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843208

Int. Cl.³ B65H *54/28*

U.S. Cl. 242—43 R **10 Claims**



1. In a thread winding apparatus having a traversing device which includes

a housing,

a rotatably driven cam roller mounted within said housing,

traversing thread guide means engaging said cam roller for reciprocating movement along said roller and projecting outwardly of said housing to receive and guide the thread being wound, and

an enlongated traverse slot in said housing arranged to extend along the cam roller to provide an opening in which said thread guide means reciprocates in a substantially straight line, the improvement which comprises:

means to generate and direct an air stream to flow outwardly from said slot, thereby preventing any portion of the thread as it is wound from entering the housing.

4,230,286

CORE HOLDER FOR REELING

Richard J. Charles, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 921,579, Jul. 3, 1978, Pat. No. 4,174,077. This application Jun. 18, 1979, Ser. No. 49,286

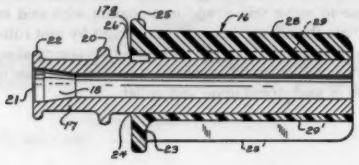
The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.

Int. Cl.³ B65H *75/02, 19/12, 19/30*

U.S. Cl. 242—68.6 **2 Claims**

1. A core holder for reeling comprising a relatively elongated metal tube having a radially extending flange adjacent to but spaced from one end of said tube, a plastic sleeve fixed on

said tube adjacent the other end of said tube and terminating a spaced distance from said flange, said sleeve having radially



outwardly projecting therefrom a plurality of longitudinally extending ribs.

4,230,287

APPARATUS FOR THE MECHANICAL NEEDLING OF PILE FABRICS

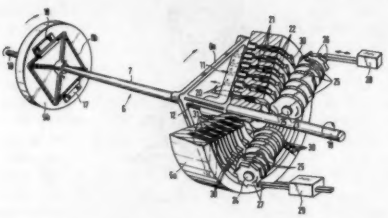
Axel Schneider, Krefeld, Fed. Rep. of Germany, assignor to Scheibler Peltzer GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,797

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756468

Int. Cl.³ B65H *75/02*

U.S. Cl. 242—77.1 **16 Claims**



1. An apparatus for the mechanical needling of pile fabrics onto a winding frame comprising:

a pair of rotatable suspension frame, each suspension frame being arranged at opposite ends of an axle and including radially disposed rows of equally spaced fabric engaging hooks movable parallel to said axle and defining concentric rings of hooks,

actuating means for moving the individual hooks toward the opposite end of said axle in a sequence beginning with the radially innermost hooks and progressing to the radially outermost hooks in synchronization with the rotation of said suspension frames,

said actuating means including ejector means rotatable with said suspension frames, cam means movable into the path of movement of said ejector means and means for moving said cam means into the path of movement of said ejector means for selectively moving said individual hooks toward said opposite end of said axle.

4,230,288

RE-TIGHTENER WITH PYROTECHNIC PROPELLANT CHARGE FOR SAFETY-BELT AUTOMATIC WIND-UP DEVICES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

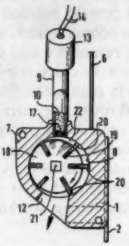
Filed Apr. 2, 1979, Ser. No. 26,077

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814487

Int. Cl.³ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107 **5 Claims**

1. In a retightener for safety-belt automatic wind-up devices having a winding shaft mounted in a bearing block, a safety belt wound around the shaft, a retightening element connected to the shaft, with a pyrotechnic propellant charge which when activated by firing the charge generates an explosive pressure on the retightening element, said retightening element being in the form of a turbine wheel connected to the winding shaft to tighten the safety belt around the body of a motor vehicle passenger to be protected and a liquid medium disposed intermediate the retightener and the pyrotechnic charge, the improvement comprising a turbine housing disposed around the turbine wheel with a hollow space on one side between the turbine wheel and the wall of the housing to form a turbine pressure chamber, a receptacle containing liquid medium with the outlet of the receptacle opening into the turbine pressure vessel, and with the outlet of the receptacle aligned substantially tangentially to the turbine wheel, wherein the turbine wheel is eccentrically mounted in a symmetrical housing bore of the turbine housing, and wherein the turbine wheel has vanes which can be displaced under the action of springs, which vanes are braced against the wall of the housing bore, and wherein the turbine housing has an outlet opening for the discharge of liquid on the side opposite the outlet of the receptacle for introduction of liquid medium into the turbine pressure chamber, and wherein a cross-section of said hollow space has a crescent shape with one end of the crescent terminating beyond the outlet of the receptacle for introduction of liquid medium into the turbine pressure chamber and the other end of the crescent terminating beyond said outlet for the discharge of liquid.



4,230,289

AUTOMATIC WIND-UP ROLLER FOR SAFETY BELTS

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,233

Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823487

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **9 Claims**

1. Automatic wind-up roller for a safety belt of a vehicle with means to block a belt shaft on which the safety belt is wound in case of danger, having a housing, a belt shaft rotatably supported in the housing, a safety belt rolled around the belt shaft, a release mechanism which is activated when a predetermined acceleration or deceleration of the vehicle is

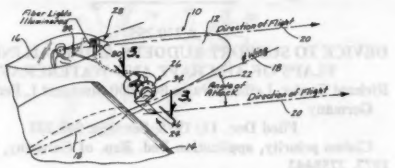
exceeded, a control lever activated by the release mechanism, a control disc rotatable with respect to the belt shaft, said control disc having elastic, yielding control teeth which couple with the control lever when the latter is activated, and a locking mechanism activated by said control disc to block said belt shaft.

4,230,290

AIRPLANE ANGLE OF ATTACK AND DIRECTION OF FLIGHT INDICATOR

Ray T. Townsend, Des Moines, Iowa, and Orville Vandewege, Tempe, Ariz., assignors to Townsend Engineering Company, Des Moines, Iowa

Filed May 1, 1978, Ser. No. 901,717
Int. Cl.[2] B64D *43/00, 45/00*
U.S. Cl. 244—1 R **20 Claims**



18. In combination with an airplane having a fuselage and a cockpit area, a device for determining the vertical direction of flight of the airplane comprising,

air actuated means is communication with air outside said fuselage and being responsive to the angle of attack of the airplane moving through the air,

visible indicator means in said cockpit area,

means connecting said air actuated means and said visible indicator means whereby changes in the angle of attack of the airplane moving through the air can be visually observed on said visible indicator means, and

a sighting device in said cockpit area arranged in relation to said indicator means such that a line of sight may be established through said sighting device and said indicator means, said line of sight corresponding to the vertical direction of flight of said airplane.

20. The method of determining the vertical direction of flight of an airplane having an airplane control center with respect to the direction of flight, comprising,

measuring the angle of attack of the airplane at the exterior of the airplane,

providing means movably responsible to the changes in the angle of attack measured at the exterior of the airplane,

visually projecting the angle of attack of said airplane at said airplane control center on an indicator means, and

sighting through a sight means and said indicator means to establish a line of sight corresponding to the vertical direction of flight of said airplane.

4,230,291

TUNED SPRING-MASS VIBRATION ABSORBER

John Marshall II, deceased, late of Cheshire, Conn. (by Richard N. James, agent), assignor to United Technologies Corporation, Hartford, Conn.

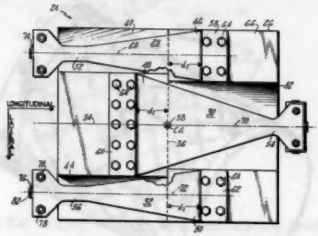
Filed Jun. 7, 1978, Ser. No. 913,720
Int. Cl.[2] B64C *27/04*; F16F *15/06*
U.S. Cl. 244—17.11 **8 Claims**

1. A tuned spring-mass vibration absorber adapted for use in a helicopter fuselage comprising:

(A) a dynamic mass member of selected mass and shaped to define at least one flat surface and a selectively positioned mass center of gravity,

(B) means suspending said dynamic mass member from the fuselage comprising:

(1) three leaf spring members comprising a center spring member with side spring members on opposite sides thereof and each spring member being of constant thickness and having a wide end and tapering gradually therefrom to a narrow end and extending in parallel relationship to one another and with the width of the center spring member being twice that of the side spring members and with the center spring member being oriented in the opposite direction to the side spring members,



(2) first means pivotally connecting the narrow ends of said leaf spring members to the fuselage so that no moment reactions are imparted to the fuselage from the spring members, and

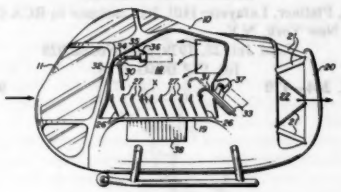
(3) second means rigidly connecting the wide ends of said spring members to said mass member flat surface and at stations in spaced relation to the mass member center of gravity so that said mass member is suspended from said spring members for vertical motion with respect to the fuselage.

4,230,292

PROPULSION/CONTROL FOR VTOL VEHICLE

Robert R. Van Nimwegen, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 9, 1978, Ser. No. 914,248
Int. Cl.[2] B64C *15/06*
U.S. Cl. 244—23 D **11 Claims**



1. In an aircraft of the verical takeoff and landing type having a body, the combination comprising:

(a) means forming an air duct in said body with an inlet at a predetermined point in the body and downwardly directed outlets at opposit sides of said body;

(b) an engine in said body;

(c) a fan in said air duct adjacent said inlet and connected for operation by said engine to cause a flow of air through said duct;

(d) a cascade of deflector blades in said duct adjacent each of said outlets, said blades being adjustable about axes disposed in a plane coextensive with the axis of rotation of said fan to direct airflow from said outlets at selected angles to the vertical; and

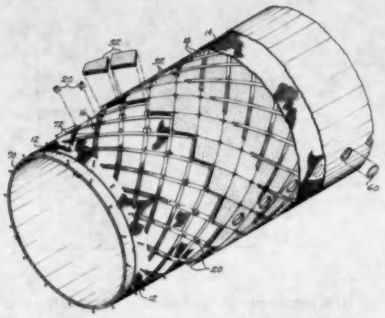
(e) door means in said air duct in advance of said outlets, said door means being adjustable to change the effective positions of said outlets relative to the center of gravity of said body.

4,230,293

COMPOSITE STRUCTURE AND METHOD OF MAKING

Robert A. Hamm, Bellevue, and Philip C. Whitener, Seattle, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Aug. 2, 1978, Ser. No. 930,457
Int. Cl.[2] B64C 1/00
U.S. Cl. 244—119 27 Claims



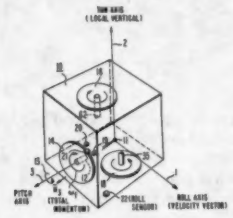
1. A hollow elongate double walled composite structure comprising: a plurality of components including an inner skin of filaments wound essentially circumferentially and longitudinally, an outer skin of filaments wound essentially circumferentially and longitudinally, patterned reinforcing strips of crisscrossing filaments to reinforce the inner skin, patterned reinforcing strips of crisscrossing filaments to reinforce the outer skin, reinforcing plugs located to extend between and to contact the skins at the intersection of the crisscrossing reinforcing strips, and contoured reinforcing panels embedded between contiguous reinforcing plugs and the skins; and a resin joining all the components together to make up a composite structure.

4,230,294

CLOSED LOOP ROLL CONTROL FOR MOMENTUM BIASED SATELLITES

Josef S. Pistiner, Lafayette Hill, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 60,029
Int. Cl.[3] B64G 1/38
U.S. Cl. 244—170 9 Claims



1. An attitude control system for a momentum biased satellite having pitch, roll and yaw axis that are each mutually perpendicular to each other and further having a pitch axis control loop including a motor for driving a bias momentum wheel about an axis parallel to the pitch axis, and further including means to sense motion of said satellite with respect to said pitch axis and provide a signal manifesting such motion, and means responsive to said sensor signal for correcting pitch axis motion errors relative to a predetermined reference, said system comprising:

a first wheel oriented to spin about an axis parallel to said yaw axis in one rotation direction;

a second wheel oriented to spin in the opposite direction from said one rotation direction about an axis parallel to said first wheel axis;

a first means for driving said first wheel at a predetermined constant speed;

a second means for driving said second wheel at a variable speed, said seconds means including sensor means oriented to sense motion of said satellite with respect to said roll axis and to generate a signal manifesting roll axis motion; and

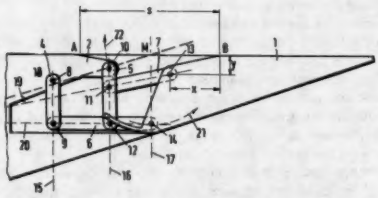
means including a closed loop control responsive to said signal manifesting roll axis motion for controlling the speed of said second motor to rotate said satellite about said roll axis to reduce errors in motion relative to said predetermined reference.

4,230,295

DEVICE TO SUPPORT RUDDERS AND TRAILING EDGE FLAPS OF AIRCRAFT AND WATERCRAFT

Richard Eppler, Leibnizstrasse 84, 7000 Stuttgart 1, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,237
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755442
Int. Cl.[2] B64C 9/02, 3/50
U.S. Cl. 244—213 10 Claims



1. A supporting device for first and second articulated elements having external surfaces thereon, between which elements a gap is formed and between the external surfaces of which a cover for the gap tangentially extends, the first and second elements being movable between an undeflected zero position relative to each other and deflected positions relative to each other, the supporting device comprising a multi-bar arc extending between the first and second elements, said multi-bar arc being disposed entirely internally of the cover and the external surfaces of the first and second elements, said multi-bar arc including:

(a) first, second, third and fourth levers;

(b) first, second, third, fourth, fifth, sixth and seventh bearing points on said levers, said first bearing point providing a connection between said first lever and the first element, said second bearing point providing a connection between said first and third levers, said third bearing point providing a connection between said second lever and said first element, said fourth bearing point providing a connection between said second lever and said fourth lever, said fifth bearing point providing a connection between said second and third levers, said sixth bearing point providing a connection between said fourth lever and the second element and said seventh bearing point providing a connection between said third lever and the second element;

(c) said first and second bearing points defining a straight line, said third and fifth bearing points defining another straight line and said seventh bearing point and a point at the center of the cover defining yet another straight line; and

(d) said straight lines, when the first and second elements are in the undeflected zero position, each intersect at a com-

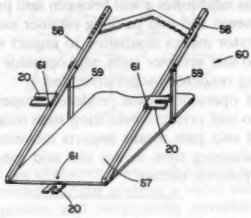
mon point whereby, as the elements move relatively into deflected positions, the cover maintains a constant length and approximately a constant curvature over such length.

4,230,296

HOLDING DEVICE FOR HUNTING EQUIPMENT

Gary M. Staley, 6708 Cliftwood, Evansville, Ind. 47712, and Monty S. Cox, R.R. 1, Box 161B, Rucker Rd., Henderson, Ky. 42420

Filed Feb. 21, 1979, Ser. No. 13,143
Int. Cl.[3] A47F *5/00*
U.S. Cl. 248—309 R **7 Claims**



1. In combination:
a tree stand of the style including:
(a) a substantially flat, horizontally disposed base platform;
(b) two side rails joined adjacent to the front edge of said base platform and inclined upwardly as they extend beyond the rear edge of said base platform; and
(c) two vertical supports each joined to a side edge of said base platform between said front edge and said rear edge and to a different one of said side rails; and
a plurality of holding devices attached to said tree stand for holding hunting implements in a ready-for-use position, each of said holding devices comprising:
(d) a substantially, flat main body portion having a substantially constant thickness throughout;
(e) two tab portions symmetrically disposed on opposite sides of a centerline of said main body portion and joined to said main body portion and outwardly extending from a common edge of said main body portion;
(f) said common edge and said two oppositely disposed tab portions defining an elongated open region centered on said centerline; and
(g) clearance aperture means for receipt of an attaching member for securing said holding device to a structural support member.

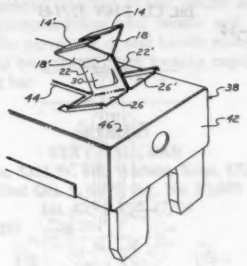
4,230,297

MOUNTING BRACKET FOR FLUORESCENT FIXTURES AND THE LIKE

O. Lawrence Comer; Wyndell G. Muse, both of Americus, and Tommy Clure, Smithville, all of Ga., assignors to Metalux Corporation, Americus, Ga.

Filed Oct. 6, 1976, Ser. No. 730,220
Int. Cl.[2] B42F *13/00*
U.S. Cl. 248—317 **9 Claims**

1. A bracket device for hanging a lighting fixture or the like form a support beam having a support surface, said bracket device including:
(a) a pair of engagement members each including a generally flat engagement surface connected together by pivot means for movement between a first open position at which said engagement surfaces are substantially separated from one another and a second closed position at which said engagement surfaces are disposed adjacent one another and in a coplanar relationship;
(b) a pair of extending members connected, respectively, to said engagement members to extend oppositely therefrom with respect to said pivot means;
(c) a pair of bearing members connected respectively to said extending members, each said bearing member including a



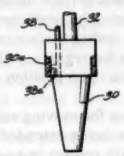
generally flat bearing surface, with said bearing members being arranged to dispose said flat bearing surfaces in a coplanar relationship parallel to the plane of said engagement member at said second closed position thereof.

4,230,298

APPARATUS FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 911,359, Jun. 1, 1978, Pat. No. 4,207,134, which is a continuation-in-part of Ser. No. 641,638, Dec. 17, 1975, Pat. No. 4,115,494, which is a division of Ser. No. 479,287, Jun. 14, 1974, Pat. No. 3,970,419, which is a continuation-in-part of Ser. No. 473,580, May 28, 1974, Pat. No. 3,966,378. This application Jan. 24, 1979, Ser. No. 5,958
Int. Cl.[3] B29C *1/12, 17/07*
U.S. Cl. 249—65 **4 Claims**

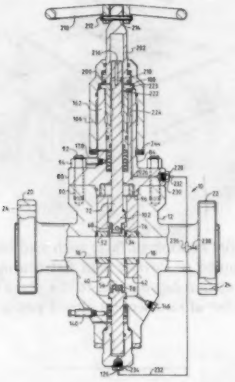


1. A core rod for use with a parison thereon having an end portion and side walls extending from said end portion and terminating in a neck region, said rod including an expandable sleeve at the neck region thereof arranged to grip the neck of the parison internally and hold the parison on the core rod for transfer of the parison from a first station to a second station in the absence of an external holding force, and means for expanding said sleeve operatively connected thereto, wherein said means includes a main fluid passageway and a second fluid passageway leading from the main fluid passageway wherein said second fluid passageway is operatively connected to said sleeve, whereby said sleeve is caused to expand against the inside of the parison neck by fluid pressure conveyed through said second passageway and whereby said parison is held on said sleeve in the absence of an external holding force, and said main fluid passageway is operatively connected to both said second passageway and the core rod beneath the neck region for conveying fluid pressure to the inside of said parison.

4,230,299
PRESSURE BALANCED GATE VALVE HAVING SELECTIVE ACTUATOR SYSTEMS

Elwood K. Pierce, Jr., Coldspring, Tex., assignor to Petroleum Designers, Inc., Houston, Tex.

Filed Jul. 3, 1978, Ser. No. 921,824
Int. Cl.[2] F16V *31//143*
U.S. Cl. 251—14 **26 Claims**



1. A pressure balanced gate valve mechanism for controlling flow of fluid, said valve mechanism comprising:

a valve body defining a valve chamber and inlet and outlet flow passages intersecting said valve chamber, said valve body being formed to define seat recess means within said valve chamber about said inlet and outlet flow passages;

seat carrier means being positioned within said valve chamber and being formed to define seat retainer means, said seat carrier means defining gate guide means;

seat means being received by said seat retainer means of said seat carrier means and being at least partially received within said seat recess means;

bonnet means forming a closure for said valve chamber and containing first packing means, said bonnet means defining stop and back-face surface means;

gate means being movably positioned between said seat means and defining sealing surface means, said gate means defining port means for registry with said inlet and outlet passage means in the open position of said valve mechanism;

manual operator means for moving said gate and including actuator stem means being extended through said bonnet and being sealed with respect to said bonnet by said first packing means, stop and back-face seal means being defined by said actuator stem means and being engageable with said stop and back-face surface means at one of the open and closed positions of said gate means;

second packing means being supported by said valve body;

a pair of pressure balancing stem means being connected to said gate means and extending at least partially through said valve body, said second packing means sealing said pressure balancing stem means with respect to said valve body said pressure balancing stem means are received within a pair of balancing chambers, said chambers are in fluid communication through a fluid line which is connected to a remote pressure source, at least one pressure balancing chamber being positioned at least partially within said actuator housing and outwardly of said first packing means, said one pressure balancing chamber is also formed within said operator, whereby the volume of fluid displaced by said pressure balancing stem means is equal and a balanced condition is mainained in each chamber during movement of said gate means;

said valve body defining second stop and back-face seal surface means; and

stop and back-face seal means being defined by said pressure balancing stem means and establishing sealing and gate positioning engagement with said second stop and back-face seal surface means in the other one of said open and closed positions of said gate means.

7. A pressure balanced gate valve as recited in claim 1, wherein:

packing retainer means is provided to retain said second packing within said valve, said packing retainer defining the other pressure balancing chamber, the other of said pressure balancing stem, means extending into said said other pressure balancing chamber

seal means establishes a seal between said pressure balancing stem means and said packing retainer means;

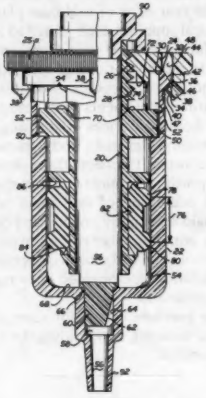
said operator means is adapted to impart reciprocal movement to said actuator stem, said operator means is capable of being rendered inoperative; and

with said operator means rendered inoperative, force applied to said pressure balancing stem means in a direction toward said gate means imparts movement of said pressure balancing stem means and said gate means to a selected position thereof.

4,230,300
FLOW METERING AND SHUT-OFF VALVE

Harold L. Wiltse, Baldwin Park, Calif., assignor to Mary Louise Wiltse, Baldwin Park, Calif.

Filed Jun. 11, 1979, Ser. No. 47,052
Int. Cl.[3] F16K *1/04*
U.S. Cl. 251—205 **20 Claims**



6. A valve having a flow passageway therethrough for controlling the flow of fluid in an intravenous flow line including:

means for connecting said valve to a source of the fluid;

means for connecting said valve to a receiver of said fluid;

a first valve portion having an axis and defining at least a portion of said flow passageway therethrough;

a second valve portion defining at least a portion of said flow passageway therethrough;

means to control the flow of fluid through said valve which depend on the relative axial positioning of said first and second valve portions; and

means to vary the relative axial positioning of said first and second valve portions including a threaded portion on said first valve portion, a collar threadably engaged with said threaded portion of said first valve portion and radially slidably engaged with said second valve portion, and means to prevent relative rotation between said first and second valve portions.

4,230,301

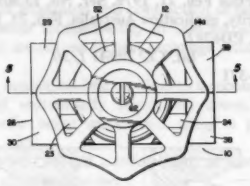
VALVE

Don R. Miller, Ashland, Ohio, assignor to U-Brand Corporation, Ashland, Ohio

Division of Ser. No. 835,637, Sep. 22, 1977, Pat. No. 4,167,195. This application Mar. 1, 1979, Ser. No. 16,683

Int. Cl.³ F16K *27/12*

U.S. Cl. 251—367 **1 Claim**



1. In a valve of the character described, a valve body having an externally threaded upright portion, a valve stem disposed in said upright portion and reciprocally movable therein, a bonnet threadedly secured to the threads of said upright portion and means constituting stops for limiting downward movement of said bonnet relatively to said upright portion, when said bonnet is being secured to said upright portion, whereby to prevent breakage of said bonnet, said means comprising vertically-extending ribs disposed below said threads and extending radially from diametrically-opposite sides of said upright portion, and adapted to be engaged by said bonnet when said bonnet is moved downwardly.

4,230,302

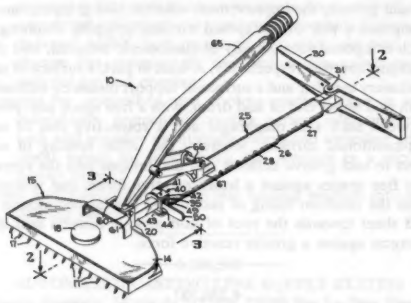
CARPET STRETCHER

Millard Crain, Jr., Pleasanton, Calif., assignor to Crain Cutter Co., Inc., Santa Clara, Calif.

Filed Jul. 19, 1979, Ser. No. 58,959

Int. Cl.³ A47G *27/04*

U.S. Cl. 254—212 **11 Claims**



1. A carpet stretcher comprising:

(a) a pin head;

(b) a sliding bar fixed to said pin head and extending rearwardly therefrom;

(c) a tubular assembly freely receiving said sliding bar in the axial direction thereof;

(d) a wall engaging member mounted on the rearward end of said tubular assembly;

(e) a sliding bar locking mechanism fixed to the forward end of said tubular assembly, said sliding bar locking mechanism including a movable locking lever extending transversely relative to said sliding bar and formed with an aperture to receive said sliding bar, said locking lever being movable to retain said sliding bar in a fixed position relative to said tubular assembly and being movable to release said sliding bar for enabling said sliding bar to be freely movable relative to said tubular assembly;

(f) a handle pivotally connected to said pin head and projecting in the general direction of said tubular assembly; and

(g) linkage interconnecting said handle and said tubular assembly, the movement of said handle enables said locking lever to be released from locking engagement with said sliding bar.

4,230,303

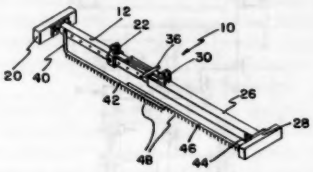
STAY NAIL BAR

Duane K. Schilz, 3351 W. 8th, Wichita, Kans. 67203

Filed Oct. 9, 1979, Ser. No. 82,609

Int. Cl.³ A47G *27/04*

U.S. Cl. 254—212 **10 Claims**



1. A stay nail bar comprising a first member, a first wall abutting block attached to an end of said first member, adjustable bracket means slidably attached to said first member for positioning said bracket means at a predetermined location on said first member, a second tubular member slidably mating with said first member for telescoping movement of said second tubular member along the exterior surface of said first member, a second wall abutting block attached to an end of said second tubular member, a lever member pivotally attached to said adjustable bracket means, a lever link pivotally attaching to said lever member and to said second tubular member such as movement of said lever member around the pivotation point with said first member causes telescoping movement of said second tubular member along the exterior surface of said first member, a first prong receiving bar connected to said first member and downwardly extending therefrom and including a section in generally parallel relationship with said first member, a second prong receiving bar connected to said second tubular member and downwardly extending therefrom and including a section in generally parallel relationship with said second tubular member, a plurality of operative prongs attached to the section of the first prong receiving bar and second prong receiving bar in parallel relationship with the first member and second tubular member, respectively, to hold a carpet steadfastly in place while stretching same.

4,230,304

ARRANGEMENT TO OBTAIN EQUAL TRAVEL OF HYDRAULIC CYLINDERS

Dirk Tol, Oud Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 974,038

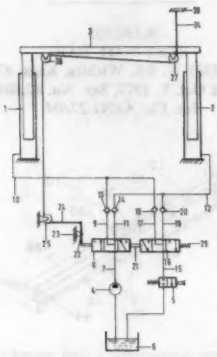
Claims priority, application Netherlands, Dec. 12, 1977, 7713705

Int. Cl.³ B66F *7/20*

U.S. Cl. 254—89 H **1 Claim**

1. An arrangement to obtain an equal travel of hydraulic cylinders in a hydraulic car lift having at least two single acting lifting cylinders powered by a common pressure source and with which a lifting platform is moved, is maintained in a substantially horizontal position by means of a leveling arrangement, and both cylinders being connected to a control arrangement which itself is controlled by the leveling arrange-

ment which is influenced by the position of the platform, wherein the control arrangement is formed by two control valve members which are rigidly interconnected and controlled by the leveling arrangement, wherein one of the control members forms an upward control member which only controls the upward movement of the platform and the other control member forming downward control member only controlling the downward movement, the upward control member being connected to the pressure pump and the downward control member being connected to a discharge valve,



said upward control member being respectively connected to said cylinders by a pair of pipelines and said downward control member being respectively connected to said cylinders by a second pair of pipelines, and wherein a pair of non-return valves are respectively inserted in the two pipelines from the upward control member to the corresponding cylinders which open in the direction towards the cylinders and a second pair of non-return valves are respectively inserted in the two pipelines from the downward control member to the corresponding cylinders which open in the direction towards the downward control member.

4,230,305

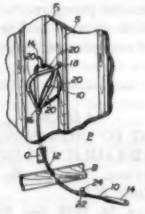
FISH GRABBER FOR USE IN ELECTRICAL WIRE INSTALLATION

Stephen S. Comroe, 1208 Lindsay La., Rydal, Pa. 19046

Filed Sep. 19, 1979, Ser. No. 76,838

Int. Cl.³ B65H *59/00*

U.S. Cl. 254—134.3 FT **4 Claims**



1. An electrical installation tool for use in electrical wire installation in areas of varying or unknown configuration, said tool comprising a hollow flexible housing, a flexible movable cable passing through said housing and having a handle end and fish wire end, a bundle of flexible loops, each having an outer end secured to said cable fish wire end, with free ends of each of the loops being fixedly held together in a movable junction to form a loop bundle, and wherein the loop bundle comprises flexible loops flaring outwardly, and means to grasp said handle end of said cable to move the fish wire cable in a direction inwardly or outwardly of said housing, thereby to vary the flaring of said loop bundle to allow passage thereof or expansion or contraction thereof to adapt the loop bundle to varying or unknown configurations.

4,230,306

SELF-TAILING WINCH

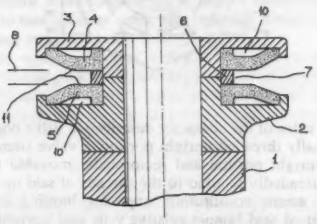
Raymond J. Porter, Panania, Australia, assignor to Barlow Marine Limited, New South Wales, Australia

Filed Feb. 21, 1979, Ser. No. 13,309

Claims priority, application Australia, Feb. 21, 1978, PD3463; Oct. 16, 1978, PD6382

Int. Cl.³ B66D *1/30*

U.S. Cl. 254—371 **6 Claims**



1. In a self-tailing winch for a sheet of the kind having in combination a stationary frame, a rotatable input shaft supported by said frame, a rotatable drum supported by said frame, a reduction gear train connecting said input shaft to said drum so that said drum is driven by said shaft, sheet gripping means attached to and axially aligned with the upper end of said drum for rotation therewith, said gripping means having inner annular surfaces defining an annular groove between them, whereby said groove defines a constant winding diameter for said sheet, said groove having an effective root diameter substantially equal to or less than the winding diameter of said drum, a stationary member anchored to said frame near the top of said drum, and sheet deflector means supported by said stationary member and adapted to feed a sheet from said drum to said groove, the improvement wherein said gripping means comprises a pair of juxtaposed toroidal gripping diaphragms each composed substantially of elastomeric material, said diaphragms abutting respectively, at least in part, a surface of said stationary member and a surface of support means co-extensive with said upper end of said drum, with a free space interposed between each said diaphragm and a respective one of said last-mentioned surfaces, whereby the initial feeding of said sheet to said groove deflects said diaphragms into the respective free spaces against a lesser reactive force, and whereby upon the resultant filling of said spaces the further motion of said sheet towards the root of said groove distorts said diaphragms against a greater reactive force.

4,230,307

COOLING APPARATUS FOR COPPER CONVERTER OPENING

Thomas P. Philip, Nababeep, South Africa, assignor to O'Okiep Copper Company Limited, Nababeep, South Africa

Filed Sep. 22, 1978, Ser. No. 944,699

Claims priority, application United Kingdom, Sep. 26, 1977, 40057/77

Int. Cl.³ C21B *7/10*

U.S. Cl. 266—46 **5 Claims**

1. In a method for cooling a mouth of a converter through which contents of said converter are discharged at high temperature, the improvement comprising:

maintaining in a storage zone as a cooling medium a combustible liquid of high temperature cracking characteristics;

cooling said cooling medium;

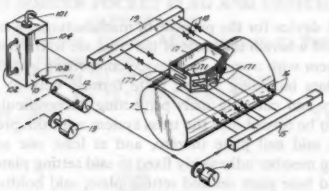
introducing said cooled cooling medium in a first header zone maintained at a preselected temperature or pressure;

selectively admitting said cooled cooling medium, to a plurality of individually segmented zones, in conduits in the form of a serpentine pipe exposed to the high temperature and embedded within a refractory material, said zones being disposed in combination with said mouth and said refractory material lining said mouth such that said individually segmented zones may be cooled;

providing for expansion and contraction of said pipe within each segment independently of said refractory material lining said mouth and in heat exchange relationship therewith;

admitting a heated cooling medium to a second header zone from said individually segmented zones, said second header zone being maintained under a predetermined pressure; and

introducing said heated cooling medium into said storage zone for recycle of same.



4. A cooling device for a converter holding and discharging hot copper contents through an opening thereof at high temperature, the combination comprising a holding vessel for a cooling medium, means for cooling said cooling medium and a first header vessel for a cooled cooling medium, said means for cooling being responsively interconnected to means for pumping said cooled cooling medium to said first header vessel;

means for selectively admitting said cooling medium to a plurality of individually segmented cooling arrays disposed around a periphery of said opening in response to a pressure maintaining means downstream from each of said segmented cooling arrays comprising conduits floatingly disposed within heat exchange fins, and said heat exchange fins restrainingly disposed within a refractory material for said opening;

means for controlling said cooling medium flow in said individually segmented cooling arrays interconnected with said pressure maintaining means and including additional means for maintaining the pressure in a second header vessel;

and means for reintroducing said cooling medium into said holding vessel.

4,230,308

AUTOMATED CASTING LINE SUPPLY SYSTEM

Eugene Gueguen, 14 rue de la Gare, 55000 Bar Le Duc, France

Filed Mar. 22, 1978, Ser. No. 889,135

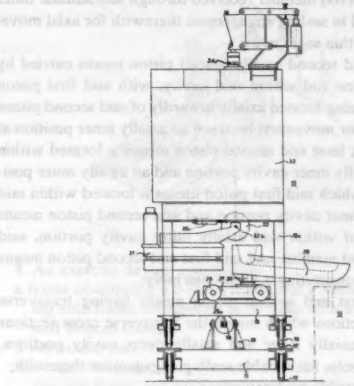
Int. Cl.³ C21D *11/00*

U.S. Cl. 266—92 **10 Claims**

1. Molten metal supply system, particularly for filling molds or boxless moldings upon a continuous casting line, the supply system comprising in combination:

a chassis which is normally stationary during the casting operation but displaceable upon a rollway, such as rails, positioned parallel to a portion of the path of a mold bearing conveyor equipped with a step-by-step advancing means, the said chassis being provided with a cart movable between two abutments, the cart being provided with a heated ladle constituting a reserve of metal permanently maintained in molten state, the ladle comprising one or more closing rods controlling delivery of the molten metal contained within the ladle,

one or more pouring troughs disposed in said mobile cart and adapted to lead the metal delivered from the ladle to casting orifices of the molds or boxless molding devices, said troughs further being adjustable in a direction perpendicularly to the displacement direction of the mobile cart



and angularly adjustable in a horizontal plane around a pivot,

means adapted to control the quantity of metal delivered by the one or more closing rods, and

indexing means adapted to control the mobile cart displacement means to provide precise positional alignment between the one or more pouring troughs and the one or more casting orifices of the molds.

4,230,309

GAS SPRING WITH AUTOMATIC LOCKING MECHANISM

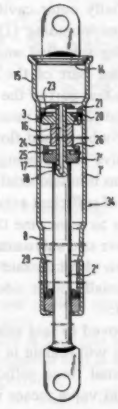
Klaus Schnitzius, Rheinbrohl, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,154

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659488

Int. Cl.² F16F *9/02, 9/06*

U.S. Cl. 267—120 **8 Claims**



1. A gas spring, comprising:

(a) a cylinder member having an axis of elongation, a closed, axially inner end wall and an annular, axially outer end wall and defining therein a sealed cavity, said cylinder including means defining a first transverse cross section over an axially inner portion of said cavity and means defining a second, smaller transverse cross section over an axially outer portion of said cavity;

(b) a piston rod member received through said annular outer end wall in sealing engagement therewith for axial movement within said cavity;

(c) first and second axially spaced piston means carried by said piston rod within said cavity, with said first piston means being located axially inwardly of said second piston means, for movement between an axially inner position at which at least said second piston means is located within said axially inner cavity portion and an axially outer position at which said first piston means is located within said axially inner cavity portion and said second piston means is located within said axially outer cavity portion, said piston rod member and said first and second piston means jointly constituting a piston assembly;

(d) said first and second piston means having transverse cross sections which match the transverse cross sections of said axially inner and axially outer cavity portions, respectively, for slidable sealing engagement therewith;

(e) a fluid within said cavity;

(f) means for permitting fluid flow from one side of said first piston means to the other when said first piston means moves axially in said cavity;

(g) first flow control means for controlling fluid flow from one side of said second piston means to the other when said second piston means is located within said axially outer cavity portion, said first flow control means being responsive, when said second piston means is in said axially outer cavity portion, to (1) axially inward movement of said second piston means for restricting fluid flow from the axially inner side to the axially outer side of said second piston means and to (2) axially outward movement of said second piston means for permitting fluid flow from the axially outer side to the axially inner side of said second piston means; and

(h) second flow control means for controlling fluid flow from the axially inner side to the axially outer side of said second piston means when said second piston means is located in said axially outer cavity portion, said second flow control means including (1) a bore in said piston assembly by-passing said first and second piston means and connecting that part of the cavity inward of said piston assembly to that part of the cavity outward of said piston assembly and (2) valve means normally biased to a closed position, at which fluid flow through said bore is prevented, said valve means being responsive, when said second piston means is in said axially outer cavity portion, to the application of sufficient axially inward force to the piston rod member to overcome the biasing force of said valve means to move said valve means to an open position, at which fluid flow through said bore from the axially inner side to the axially outer side of said second piston means is permitted;

(i) whereby when moved to said axially outer position said piston rod member will remain in said axially outer position until an external force sufficient to overcome the biasing force of said valve means is applied to the piston rod member to move it inwardly of said axially outer position.

4,230,310

COMPRESSIBLE HOLDING MEMBER

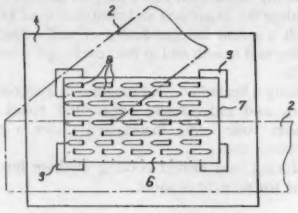
Josy Henggeler-Achermann, Winterthur, Switzerland, assignor to Lega-Norm AG, Winterthur, Switzerland

Filed Jun. 20, 1978, Ser. No. 917,186

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727859; Dec. 19, 1977, 2756530

Int. Cl.³ B23Q *3/02, 3/18*

U.S. Cl. 269—316 **13 Claims**



1. A device for the purpose of manufacturing a truss system of wood wherein the parts of the truss are to have nails forced into them with a press, the device comprising a setting plate, a nail plate including a base plate formed with at least three corners and carrying nails projecting perpendicularly therefrom to be forced into the truss system with the press so as to secure said nail plate thereto, and at least one selfadhesive holding member adhesively fixed to said setting plate for locating said base plate on said setting plate, said holding member being formed from resilient plastic material having a planar configuration and having an adhesive substance on one planar face thereof and including means at one side thereof for lying against the edge of said base plate at at least two points respectively on both sides of at least one said corner thereof and is compressible so that when the press forces the nails into the wood, said base plate can also be forced into the wood.

4,230,311

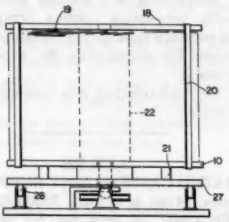
STORAGE PALLET ARRANGEMENTS FOR FOLDED PAPER ITEMS

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Filed Jan. 23, 1979, Ser. No. 5,879

Int. Cl.³ B65H *5/22*

U.S. Cl. 271—3.1 **9 Claims**



1. A storage pallet assembly holding a plurality of folded paper items of at least two pages with a fold and open ends, comprising in combination, a bottom support member presenting only a horizontally disposed planar surface facing upwardly to receive said items in a stacked relationship thereupon and having a central vertical axis about which the items may be symmetrically disposed in a helical shingled array with the center of gravity along said axis so that the support member may be rotated for loading and unloading a stack of said items, and a stack of items in a shingled helical array on said support member symmetrically arrayed in a helix about said

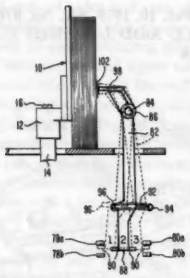
axis unsupported by any other member than said planar surface and having the open ends forward toward the lowermost end of the helical array and with fold trailing toward the upper end of the helical array and with each subsequent member being shingled upon the next preceding item with open ends overlapping the fold of the preceding item so that the topmost item has an accessible folded edge directed toward the uppermost end of the helical array for grasping to remove the shingled items individually or in shingled sequence from the top of the helical array where they are not weighted down by other items and thus can be unloaded faster with less inertia from said simplified storage pallet, wherein a tape member is wound helically under each one of the stored items stacked on said pallet, thereby providing means accessible from the top of the stack of items for lifting a leading edge of each item during removal from the stack.

4,230,312

ITEM SORTER POCKET FLAG AND SWITCH APPARATUS

William B. Templeton, Howell, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 23, 1978, Ser. No. 953,647
Int. Cl.³ B65H *31/04*
U.S. Cl. 271—215 **7 Claims**



1. Item sorter pocket flag and switch apparatus for the pocket receptacle of a sorter reader comprising;

a rack,

means engaging said rack for moving the latter in opposite directions along a horizontal, linear path,

an item pocket flag carried by and moveable with said rack and adapted to act as a vertical support for items incapable of being self supporting,

a flexible member disposed adjacent to said flag and providing complimentary vertical support for said items,

switch means including an arm rotatable about an axis spaced intermediate ends of the arm, a first end of the arm supporting said flexible member, said switch means including oppositely disposed photo optical means having a fixed position relative to said axis, interruptor means secured to the second end of said arm to operably energize and deenergize said photo optical means and produce signals as the interposition of items between said pocket flag and said flexible member causes said flexible member to move relative to said flag, and

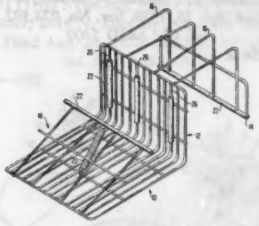
reversible drive means operably coupled to said rack engaging means and controlled by the signals to provide a relatively constant minimal spacing between said flag and said flexible member throughout the length of said rack by adjustably moving said rack to accommodate additional items.

4,230,313

EXERCISE DEVICE

Thomas M. Chupp, Jr., 2479 Jewell Dr., Marietta, Ga. 30066

Division of Ser. No. 789,588, Apr. 21, 1977, Pat. No. 4,182,509.
This application Apr. 5, 1979, Ser. No. 27,323
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—93 **2 Claims**



1. An exercise device comprising:

a frame comprising a bottom frame and a vertically extending side frame contiguous at its base with a first edge of said bottom frame;

a horizontal bar;

bar-supporting members connected to said vertically extending side frame and supporting said horizontal bar; and

self-tightening clamping means for securing said frame to a door;

said clamping means comprises:

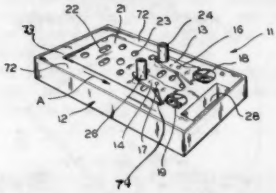
a second side frame hinged at its base with a second edge of said bottom frame and biased towards said first side frame by means of a bias spring connected between said second side frame and said bottom frame so as to define a door-receiving space between said first side frame and the upper edge of said second side frame.

4,230,314

SKATE BOARD GAME

Gordon A. Barlow, Evanston, and John R. Krutsch, Glenview, both of Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Oct. 12, 1978, Ser. No. 950,741
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—1 E **10 Claims**



1. A skate board game comprising:

an endless tape;

apertures in said endless tape;

at least one miniature skate board mounted on said endless tape;

means for moving said endless tape past said at least one miniature skate board;

means for steering said at least one miniature skate board to avoid aligning portions of said at least one miniature skate board with said apertures;

a storage container on said at least one miniature skate board;

pellets stored within said storage container; and

means to enable said pellets to fall from said storage container through said apertures in said endless tape when said storage container on said one miniature skate board and said apertures are aligned.

4,230,315

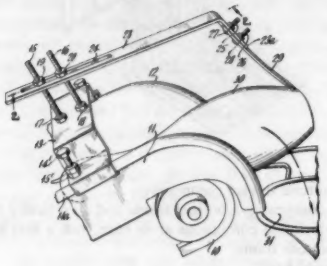
POSITIVE TURRET INDEXING APPARATUS

Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223

Filed Dec. 26, 1978, Ser. No. 973,102

Int. Cl.[3] A63D *5/00*

U.S. Cl. 273—54 R **9 Claims**



1. In a bowling pin setting machine, a cross conveyor belt bounded by stationary vertical side walls, and a turret indexing paddle beyond and below the exit of the conveyor belt, wherein the improvement comprises a bracket, means supporting said bracket above the conveyor belt, an arm attached to said bracket having an end extending beyond the conveyor belt exit, the arm having downwardly projecting means at said end adapted to deflect a pin exiting from said conveyor belt down onto said turret indexing paddle.

4,230,316

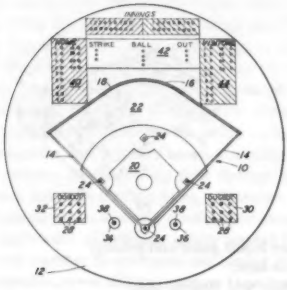
METHOD OF PLAYING A BASEBALL BOARD GAME

Charles Harper, Site 12, Box 5, R.R. #1, Lively, Ontario, Canada (P0M 2E0)

Continuation-in-part of Ser. No. 769,677, Feb. 17, 1977, abandoned. This application May 30, 1978, Ser. No. 910,856

Int. Cl.[3] A63F *3/00*

U.S. Cl. 273—93 R **2 Claims**



1. A method for playing miniature baseball utilizing a game board having a playing surface thereon, said playing surface delineating a play action area from a non-play action area, said game board having a plurality of apertures residing at the boundary between said play action area and said non-play action area, a die having indicia in the form of words disposed on the faces thereof, said words describing the baseball occurrences "homer," "single," "ball," "strike" and "out," a marker for removable insertion into said apertures, whereby the method comprises the step of throwing the die onto the surface of the game board, followed by the step of scoring the results described by the chance landing of the die in either the play action area or the non-play action area, followed by the steps whereby said marker may be manually advanced in accordance with the standard rules of baseball from one base to an adjacent base as directed by the baseball game occurrence indicated by the indicia on the uppermost die face in progressive fashion, normally only when said die lands in said play action area, the die when landing in the non-play action area scoring as a "ball" regardless of what indicia appears on the uppermost die face, and whereby said marker may be normally advanced in said progressive fashion when said die lands upon said non-play action area in accordance with said standard rules of baseball only if such landing results in the scoring of the fourth "ball" before the occurrence of an "out".

4,230,317

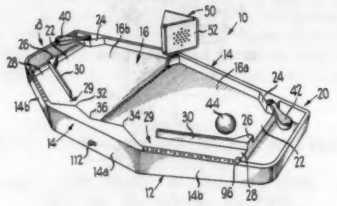
SOUND ACTUATED COMPETITIVE GAME APPARATUS

Jeffrey D. Breslow, Highland Park; Alan A. Hicks, Chicago; Eugene Jaworski, Park Ridge, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,406

Int. Cl.[3] A63D *3/02;* **H01H** *35/24*

U.S. Cl. 273—119 A **12 Claims**



1. A competitive game apparatus for two or more players, comprising:

a frame defining a playing area;

means defining at least a pair of player stations at opposed locations on the playing area;

at least one playing object;

propelling means generally adjacent each of said player stations;

drive means for actuating said propelling means in a timely manner for directing the playig object generally toward the opposing player's station;

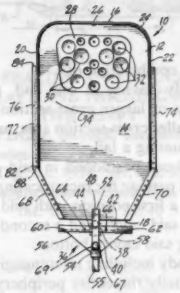
means for inhibiting operation of said drive means for a predetermined interval;

control means responsive to audible signals for energizing said drive means in response to a signal produced by a player of the game from a remote location, said control means including a sound transducing means for generating electrical impulses in response to received sounds, means for amplifying said generated electrical signals, timing means responsive to said amplifying means for actuating said drive means for a selected time interval and feedback means for initializing said inhibiting means at the end of said selected time interval whereby the players compete by alternatively actuating their associated propelling means to drive the playing piece toward an opponent.

4,230,318
SHOOTER BOARD GAME

Kenneth E. Dimond, 311-615 Colborne St., New Westminster, Canada (V3L 2E1)

Continuation-in-part of Ser. No. 828,624, Aug. 29, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,969
Int. Cl.[3] A63D 3/02
U.S. Cl. 273—119 R 4 Claims



1. A shooter board game, which comprises:

a. a board member having an upper planar playing surface, a pair of sides, and a pair of ends, and flange members secured to said pair of sides and one of said pair of ends extending upwardly from said planar surface, the other side of said pair of ends extending along a straight line;

b. a target area disposed on said upper surface of said board member adjacent said one end thereof;

c. a shooter assembly selectively positionable away from touching engagement with said board member and in touching engagement with said board member at said other of said pair of ends, said shooter assembly including a cross-shaped element, said cross-shaped element having a first elongated arm, a second elongated arm, said second arm joined to a lower surface of said first arm, said first arm having a straight marginal edge, a block member slidably disposed on said first arm, wherein said one of said playing pieces is projectable intermediate said flange members disposed at said pair of sides of said planar surface and towards a portion of said flange members disposed at said one of said pair of ends of said planar surface where said straight marginal edge is selectively located adjacent to said other of said pairs of ends, and a V-shaped element disposed on a surface of said block member, said one of said playing pieces being disposed within said V-shaped element, and a first elastic band member communicating between one said block and one end of said second arm, and a second elastic bank member communicating between said block and another end of said second arm, and a pair of stop members extending upwardly from said second arm, said pair of stop members being aligned parallel to said straight edge, said stop members engaging said elastic bands thereby restricting forward motion of said block member;

d. two sets of a plurality of disc shaped playing pieces, one of said playing pieces at a time removably received onto said shooter assembly to be forwarded projected across said upper surface towards said target area;

e. two scoring tracks, each said track including an elongated bar member having a plurality of longitudinally aligned apertures disposed in its upper surface, said apertures being numbered from a minus numerical indicia at one end to a positive numerical indicia at another end of said bar each of said two scoring tracks located at said flange members disposed at said pair of sides of said planar surface;

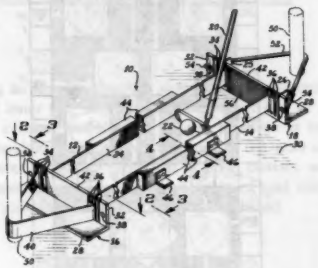
f. four first colored pegs, two of set pegs removably received in said end apertures of each said track; and

g. two second colored pegs, one of said second pegs removably received in said apertures of each of said bars between said first colored pegs.

4,230,319
PUTTING STROKE PRACTICE DEVICE

Max E. Lindner, 2516 N. 22nd Dr., Phoenix, Ariz. 85009

Filed Aug. 28, 1978, Ser. No. 937,167
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—192 7 Claims



1. A putting stroke practice device comprising:

(a) a spaced pair of support brackets each having a vertical surface, said support brackets positionable with their respective vertical surfaces facing each other;

(b) a pair of elongated strap members each having opposite planar surfaces and each formed of thin flexible material, said pair of strap members each extending between said pair of support brackets in spaced parallel relationship with the opposite planar surfaces of said strap members being vertically disposed;

(c) said pair of strap members and said pair of support brackets restingly positionable on any surface which is suitable for putting for enclosingly defining a portion of that surface as having a putter swing area and an intended travel path of a struck golf ball;

(d) connection means formed adjacent each of the opposite side edges of the vertical surfaces of said pair of support brackets for demountably connecting said pair of strap members to said pair of support brackets, said pair of strap members adjustably positionable in said connection means for varying the spacing between said pair of support brackets and for varying the spacing between said pair of strap members; and

(e) anchoring means extending rearwardly from each of said pair of support brackets for demountably attaching said support brackets to fixed objects.

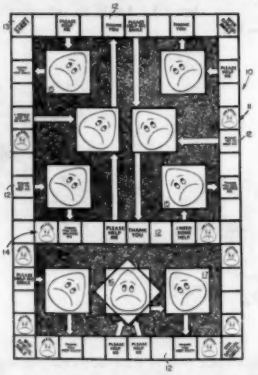
4,230,320
GAME BOARD WITH CORRESPONDING CARDS

Norman W. Crew, Jr., 14 Porters Core Rd., Hingham, Mass. 02043

Filed Sep. 18, 1978, Ser. No. 942,948
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—243 9 Claims

1. A game comprising a game board on the surface of which is provided a closed circuit of a plurality of individual, serially arrayed first player spaces, a starting space within said closed circuit, a row of a plurality of individual, serially arrayed first player spaces interconnecting two spaced-apart, somewhat oppositely located of said first player spaces in said closed circuit, a plurality of second player spaces adjacent to said closed circuit and said row of first player spaces, each of which said second player spaces is interconnected by directional arrows with at least two of said first player spaces and said

arrows pointing in only one direction from one said first player space to another of said first player spaces, said first and second player spaces carrying suitable indicia thereon, at least one each third and fourth player spaces adjacent to said closed circuit and row of first player spaces and interconnected with one another by a directional arrow pointing in only one direction, said third player space being a double space and connected by direction arrows to two adjacent first player spaces, the directional arrows pointing only from the first player



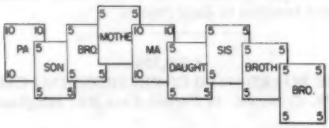
spaces to the third player space, and said fourth player space being additionally connected by directional arrow pointing only to a first player space, indicia on said third and fourth player spaces, a first plurality of cards carrying indicia corresponding to the indicia carried by said second and third and fourth player spaces, a second and third plurality of cards carrying other suitable indicia, a playing piece for each player, and means operable to determine the number of player spaces to be moved on the game board by a player.

4,230,321

FAMILY RELATIONSHIPS CARD GAME

Mildred E. Smith, 1609 Madison St., NW., Washington, D.C. 20011

Continuation-in-part of Ser. No. 850,396, Nov. 10, 1977, abandoned. This application May 10, 1979, Ser. No. 37,887
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—308 **6 Claims**



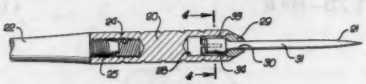
1. A card game adapted for teaching family relationships comprising a first distinctive group of cards carrying indicia identifying the individual members of plural generations of a family and including a plurality of cards for each such member; and a second group of cards distinctive from the first group each carrying indicia descriptive of the relationship existing between a given pair of different family members within said plural generations from a player's perspective and including a plurality of such cards for each such relationship for linking during play the association of pairs of said family member cards in a predetermined pattern.

4,230,322

NO BOUNCE DART

Walter E. Bottelsen, 7259 Del Norte, Goleta, Calif. 93017

Filed Jan. 22, 1979, Ser. No. 5,142
Int. Cl.³ A63B *65/02*
U.S. Cl. 273—420 **6 Claims**



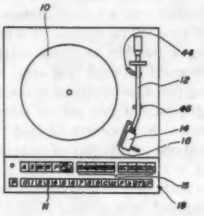
1. In a dart, the combination of:
an elongate body having at one end, means defining an interior cavity of larger cross-section area and an axial passage of smaller cross-section area, and at the other end, means for mounting a tail;
a point with a head positioned in said cavity and a shaft slidable in said passage for reciprocating movement of said head between a first position with said head remote from the bottom of said cavity and a second position with said head engaging said cavity bottom;
said point and body including interengaging means disposed about substantially the entire periphery of said head and cavity resisting movement of said head from said first to said second position and maintaining engagement between said head and the wall of said cavity as said head moves from said first to said second position.

4,230,323

AUTOMATIC RECORD PLAYER

Sigeki Tsuji, Tenri; Hiromichi Shiozaki, and Eiji Yamasaki, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1978, Ser. No. 945,898
Int. Cl.³ G11B *17/06*
U.S. Cl. 274—9 RA **25 Claims**



1. An automatic player comprising:
support means for supporting a disc;
disc drive means for rotating said disc on said support means;
pickup means for performing play operation;
pickup means drive means for shifting said pickup means to a desired address on said disc;
pickup means position detecting means for producing a signal indicative of an address of said pickup means on said disc;
input means for introducing a preselected address to be played into the automatic player;
storing means for storing said preselected address;
comparing means for comparing said preselected address stored in said storing means with the signal produced by said pickup means position detecting means and providing an output signal upon coincidence thereof;
control means for activating said pickup means drive means in response to said output signal of said comparing means so that said pickup means is positioned at said preselected address;
non-recorded section detection means connected to said

pickup means, for detecting a non-recorded section formed between two adjacent tracks recorded on said disc;

converting means for calculating an address of said non-recorded section using the signal produced by said pickup means position detecting means and the signal transmitted by said non-recorded section detection means and transmitting said address to said storing means for storage therein; and

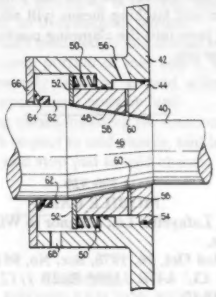
further input means for selecting at least one desired track to be played.

4,230,324

DEVICE FOR SEALING AN ANNULAR OPENING BETWEEN A SHAFT AND HOUSING SURROUNDING THE SHAFT

Karl G. Derman, Partille, Sweden, assignor to K. G. Derman AB, Partille, Sweden

Filed Dec. 22, 1978, Ser. No. 972,337
Claims priority, application Sweden, Dec. 23, 1977, 7714719
Int. Cl.³ F16J *15/46*
U.S. Cl. 277—74 **8 Claims**



1. The combination comprising a shaft extending through an opening in a housing mounted for rotation relative to one another, a unitary, annular sealing ring mounted in the annular space between the shaft and the housing in sealing relation with the housing, said unitary annular sealing element having a first conical surface confronting a second conical surface on the shaft which in a first position is in sealing engagement therewith, means for supplying a pressure fluid to the annular space between said confronting conical surface at a pressure higher than the pressure in the zones on opposite sides of said sealing ring thereby to displace said annular sealing ring in an axial direction to a second position whereby the pressurized fluid exits from the annular space between the conical surfaces and thereby effectively separates the lower pressure zones on opposite sides of said sealing ring.

4,230,325

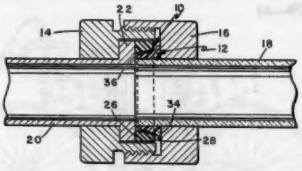
CONJUGATE TWO-PIECE PACKING RING WITH LIMITER

Payson M. Butler, 14360 Rios Canyon Rd., Space 57, and Jack O. Butler, 1244 E. Main St., both of El Cajon, Calif. 92021

Filed Oct. 10, 1978, Ser. No. 949,624
Int. Cl.³ F16J *15/10*
U.S. Cl. 277—117 **2 Claims**

1. A conjugate packing ring for sealing fixed and cylindrical elements, using a gland nut, said packing ring, comprising: a substantially rigid, slightly compressible inner ring, of non-metallic material and discrete from said elements, having a cylindrical bore for snug reception of one of said elements and having a smooth external, tapered surface and having two flat faces normal to the axis of said bore; and

an outer ring, of non-metallic material and discrete from said elements, encircling said inner ring and having a tapered bore receiving the tapered external surface of the internal ring in intersealing relationship therewith and having two flat end faces and being capable of near zero expansion in use with a gland nut pressing said inner ring between said outer ring and said one of the elements, said inner ring



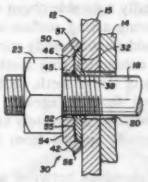
having an annular shoulder extending radially outwardly of the inner ring and between the larger end of said tapered external surface and the flat end face at that end, said shoulder limiting the penetration of the inner ring into the outer ring and providing sealing contact with the corresponding one of said end faces of said outer ring when said gland nut is sufficiently tightened.

4,230,326

SEALING ASSEMBLY FOR BALL OR ROD MILLS AND THE LIKE

Leonard D. White, Vancouver, Canada, assignor to Lister Bolt & Chain Ltd., Richmond, Canada

Filed Aug. 17, 1978, Ser. No. 934,652
Int. Cl.³ F16L *5/02, 59/12*
U.S. Cl. 277—166 **10 Claims**

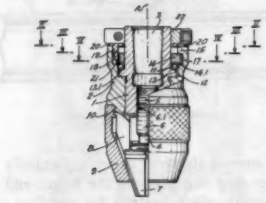


1. A sealing assembly for use on a bolt projecting through a hole in a wall enclosing slurry or the like and comprising an annular seal formed of a deformable material adapted to be inserted over the bolt into contact with an outer surface of the wall, said annular seal having a central opening bordered by a peripheral sealing edge and an outer face encircled by a bevelled sealing edge, the outer face and the sealing edge defining between them an included angle greater than 90°, and a substantially non-deformable washer adapted to be fitted to the bolt to bear against the outer face of the annular seal, said washer having an inner face and an inwardly inclined sealing edge shaped to engage the bevelled sealing edge of the annular seal, so that said annular seal can be compressed against the outer surface of the wall and extruded radially towards the bolt in response to a clamping force applied when a nut is tightened on the bolt to wedge the inclined sealing edge against the bevelled sealing edge whereby the peripheral sealing edge is forced into slurry-type engagement with the bolt.

4,230,327
DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 26,886
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815026; Apr. 26, 1978, 2818247
Int. Cl.³ B23B 31/12
U.S. Cl. 279—61 10 Claims



1. A chuck comprising:

a chuck body defining a chuck axis and formed with an annular body surface centered on said axis, lying in a plane substantially perpendicular to said axis, and facing in one axial direction;

a plurality of generally angularly equispaced and radially displaceable jaws on said body;

a tightening sleeve rotatable on said body about said axis;

means including formations on said jaws, on said body, and on said sleeve for displacing said jaws radially inwardly on rotation of said sleeve on said body in one rotational sense and for permitting radial outward displacement of said jaws on rotation in the opposite sense;

an array of radially extending sleeve teeth on said sleeve angularly spaced about said axis and defining intertooth gaps, each sleeve tooth having a sleeve-tooth surface generally parallel to, axially confronting, and axially spaced from said annular body surface;

a bearing ring centered on said axis and received between said sleeve teeth and said annular body surface, said ring being at least limitedly rotatable about said axis relative to said sleeve and having a ring surface axially confronting and spaced from said annular body surface;

an array of radially extending ring teeth on said ring and similar to said array of sleeve teeth, each ring tooth having one axially directed face engageable with said sleeve-tooth surfaces and another oppositely axially directed face confronting and axially spaced from said annular body surface;

a plurality of roller elements between and riding on said body and ring surfaces; and

a locking element engaging through at least one of said intertooth gaps and holding said ring teeth in axial alignment with said sleeve teeth with said one faces of said ring teeth bearing flatly on said sleeve-tooth surfaces, whereby said locking element prevents rotation of said ring relative to said sleeve.

4,230,328
DEVICE FOR CONNECTING AN EJECTION PIN OF AN INJECTION MOLDING TOOL OR THE LIKE TO AN EJECTOR DEVICE

Hans K. Muller, 12 5:e Villagatan, 502 44 Boras, Sweden

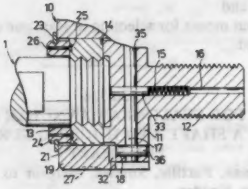
Filed Oct. 25, 1978, Ser. No. 954,724
Claims priority, application Sweden, Apr. 27, 1978, 7804845
Int. Cl.³ B23B 31/16
U.S. Cl. 279—71 5 Claims

1. A device to connect (a) an ejector pin of a mold for injection molding, and (b) an ejector device of an injection molding machine, comprising in combination:

(i) a holding means having jaws radially movable therein for clamping and unclamping said ejector pin,

(ii) manually operable actuation means for moving said jaws at least to the unclamping position thereof,

(iii) at least one spring acting to urge said jaws towards the clamping position thereof,



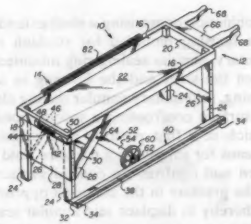
(iv) a latching means to hold said jaws in the unclamping position thereof, and

(v) a release means mounted in said holding means to cooperate with said ejector pin such that when actuated by said ejector pin said latching means will allow said springs to bring said jaws into the clamping position thereof to lock said ejector pin.

4,230,329
MOBILE CART

Aldus Johnson, Lafayette, La., assignor to William H. Lambert, Lafayette, La.

Filed Oct. 16, 1978, Ser. No. 951,960
Int. Cl.² A47B 31/04; B62B 1/12, 1/14
U.S. Cl. 280—43.17 5 Claims



1. A portable Mobile Cart for supporting and transporting doors, panels and other planar-shaped articles and woodworking tools used in building construction, and for use as a portable workbench for performing installation operations on such articles, said cart comprising:

(a) A support frame for receiving and supporting a planar-shaped article in horizontal position and for transporting woodworking tools, said frame having

(1) an upper surface for supporting the article, and

(2) a plurality of legs for supporting said upper surface,

(b) a first support means mounted with said support frame legs for positioning, transporting and supporting a planar-shaped article parallel to the vertical axis of said cart,

(c) a second support means mounted with said support frame upper surface for retaining a planar-shaped article being carried by said first support means,

(d) a means for mobilizing said cart, and

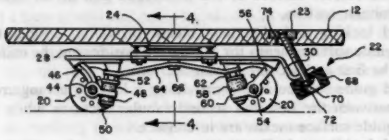
(e) a handle means for enabling said cart to be moved as desired.

4,230,330

SKATEBOARD

Clifton C. Muhammad, Chicago, Ill., assignor to Carter Bros. Iron Works, Inc., Ill.

Filed Feb. 13, 1978, Ser. No. 877,316
Int. Cl.[3] A63C *17/02*
U.S. Cl. 280—87.04 A 10 Claims



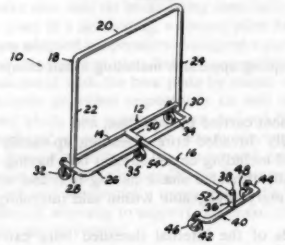
1. A skateboard comprising:
a chassis;
two parallel axles mounted below said chassis;
four wheels, two of which are rotatably mounted to each axle;
a board rotatably mounted to said chassis adapted to support a rider, said board extending beyond at least one of said axles to provide an overhanging portion;
a stop pad removably mounted to said chassis in the vacinity of the overhanging portion of said board, said stop pad adapted to generally face the ground when said skateboard is in an operational position; and
removable locking means for fixing the rotational position of said board with respect to said chassis, said locking means also mounting said stop pad to said chassis.

4,230,331

RIDER PROPELLED TOY VEHICLE

Sterling V. Johnson, 916 NE. 16, Oklahoma City, Okla. 73104

Filed Mar. 5, 1979, Ser. No. 17,294
Int. Cl.[3] B62M *29/00*
U.S. Cl. 280—218 3 Claims



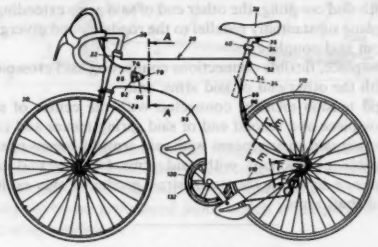
1. An occupant propelled toy vehicle, comprising:
a generally horizontally disposed substantially T-shaped frame having a cross bar portion and a stem portion;
hand grip means projecting vertically above said cross bar portion in coextensive parallel relation;
tailpiece means connected with the end of said stem opposite said cross bar portion for supporting the feet of an occupant,
said stem portion being formed from flexible material capable of being arcuately bent and returning to a position of repose in a horizontal plane in response to lateral force applied thereto by the occupant while standing on said tailpiece means; and,
wheel means for supporting said frame.

4,230,332

BICYCLE FRAME

Ferdinand A. Porsche, Gut Heuberg, Winkl 5, St. Georgen, A-5662 Gries im Pinzgau, Austria

Filed Feb. 14, 1979, Ser. No. 12,180
Int. Cl.[3] B62K *19/08*
U.S. Cl. 280—281 B 9 Claims



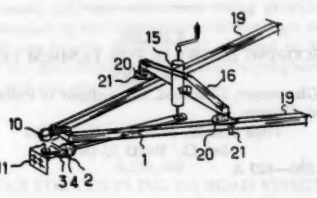
1. A bicycle frame comprising a hollow tubular steering support column which is formed to receive and rotatably support a handlebar and front wheel fork assembly, a hollow tubular seat support column which is formed to receive and adjustably support a seat assembly, the frame having the form of a hollow panel connected to and extending between said columns, said hollow panel being formed of two side panels which are disposed in spaced apart parallel relation to each other and surround the steering support column and the seat support column, each of said side panels being a three-ply laminate which has thin sheets of material bonded to opposite surfaces of a lightweight core.

4,230,333

TOW STABILIZER

Roland Persyn, Le Hameau des Muriers, Carbon Blanc, France (33560)

Filed Oct. 6, 1977, Ser. No. 839,935
Claims priority, application France, Oct. 12, 1976, 76 31313; Apr. 6, 1977, 77 12110
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—406 A 11 Claims



1. A tow stabilizer for a tow frame for coupling to a towing vehicle, said vehicle having a coupling attached thereto for connection with said tow frame, comprising:
spring means including first and second ends, said spring means extending along a substantially horizontal axis of the tow frame relative to the vehicle roadway;
clamping means including means for connection to said towing vehicle, said clamping means including an axle having an axis which is substantially parallel to the roadway, and extending in a direction transversely to the horizontal axis of said tow frame, said clamping means including locking pins and apertures for receiving said locking pins;
said first end including means pivotally connecting said spring means with said axle for movement in a vertical

plane relative to said clamping means, said spring means being positioned between said locking pins, and said locking pins controlling the amount of movement of said spring means in the vertical plane;

said clamping means being pivotally mounted about a vertical axis and including friction means, said friction means braking the pivotal displacements of said clamping means;

a pair of arms connected together at one end thereof and with said coupling, the other end of said arms extending in a plane substantially parallel to the roadway and diverging from said coupling;

a crosspiece, flexible connections connecting said crosspiece with the other end of said arms; and

a rigid tension member connected with the center of said crosspiece and second end of said spring means and connecting said spring means with said arms by means of said flexible connections with said arms forming said tow frame to distribute the tensile stress produced over each of said shaft arms.

4,230,334

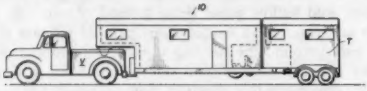
CANTILEVERED MEDIAL TRAILER

Vern D. Mabry, Jr., 2560 Crowdis La., Ruscue, Calif. 95672

Filed Jan. 22, 1979, Ser. No. 5,386

Int. Cl.[3] B62D *53/04*

U.S. Cl. 280—415 R **7 Claims**



1. A medial cantilevered trailer supported solely by a towing vehicle and a depending trailer comprising means for detachably connecting the front end of said medial cantilevered trailer to said towing vehicle, retractable means for supporting the front and rear ends of said medial cantilevered trailer in a stationary position, a three way bar and scissors hitch including a ball and socket arrangement on the rear end of said medial cantilevered trailer, and the front end of said depending trailer for supporting said medial cantilevered trailer with said retractable means in a retracted position for towing of said trailers by said towing vehicle.

4,230,335

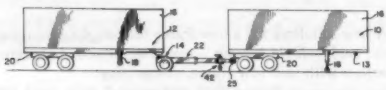
TELESCOPING DRAWBAR FOR TANDEM TRACTOR TRAILERS

John J. Glassmeyer, Glenwood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Feb. 22, 1979, Ser. No. 14,185

Int. Cl.[3] B62D *53/04*

U.S. Cl. 280—423 A **21 Claims**



1. A telescoping connection extending from a dolly for use in connecting a leading trailer to a tandem-connected trailer, the improvement comprising:

a drawbar,

said drawbar comprising tubular means with portions telescoped to overlap each other,

said tubular means comprising a first tubular section with means securely attached to said dolly and having end means spaced from said dolly and providing an inside surface,

said tubular means comprising second tubular section with a connecting end fitted within the said first tubular section,

said second tubular section having a telescoped end having an outside surface,

locking and alignment means with means attached to said inside surface of the end means of the first tubular section, and, associated locking and alignment means attached to the outside surface of the telescoped end of the second tubular section,

said locking and alignment means providing cooperating guide surface means for accurately positioning the ends of the first and second tubular sections,

said guide surface means providing a locking arrangement between the first and second tubular sections when the guide surface means are in contact,

each locking and alignment means comprising:

locking wedge means rigidly affixed to one section of said tubular means and having guide surfaces extending in a tapered fashion, and

stops means on the other section having a substantially U-shaped cutout and providing inclined surfaces for cooperation with said locking wedge in locking and aligning the tubular sections.

4,230,336

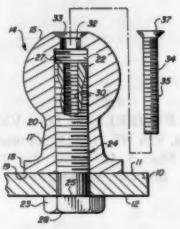
BALL COMPONENT FOR COUPLING APPARATUS

Walter C. Avrea, 1405 Whalers Way, Tempe, Ariz. 85283, and Robert N. Hansen, 14 W. Main, Avondale, Ariz. 85323

Filed Dec. 4, 1978, Ser. No. 965,690

Int. Cl.[3] B60D *1/06*

U.S. Cl. 280—507 **7 Claims**



1. In a coupling apparatus including a ball component having

a base,

a ball element carried by said base, and

an internally threaded bore extending upwardly from said base, and including an attachment bolt having

an externally threaded shank having first and second ends and matingly engageable within said internally threaded bore,

the threads of the internal threaded bore extending upwardly from said base and of the externally threaded shank of the attachment bolt having a thread pitch of a first valve, and

a head carried at the first end of said shank, for attachment to a support member having

a top surface for receiving said base thereagainst,

a bottom surface for receiving said head thereagainst, and

an opening for receiving said shank therethrough, and for detachable engagement with a complemental coupler component having a socket for receiving said ball element, improvements therein for detachably securing said ball component to said support member, said improvements comprising:

(a) locking member including

i. an elongate shank,

ii. a head carried at one end of said shank, and

iii. external threads formed on said shank;

(b) internal threads are formed in a bore formed in said externally threaded shank from the second end thereof matingly engageable with the threads on said elongate shank, the external threads of the shank of the locking member and the internal threads formed in the bore formed in the shank of the attachment bolt having a thread pitch having a second value substantially different from that of the first value; and

(c) a bore in said ball component coaxial with said externally threaded shank for receiving said elongate shank therethrough said head of the locking member when screwed into the bore formed in the shank of the attachment bolt engaging the ball component, whereby attempted rotation of the attachment bolt to loosen same will jam the head of the locking member against the ball component to resist further attempts to loosen the attachment bolts.

4,230,337

SKI BINDINGS AND SKI BRAKES ASSOCIATED THEREWITH

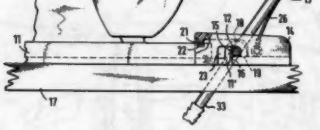
Ralf Storandt, Leonberg, Fed. Rep. of Germany, assignor to Verrinigte Baubeschlagfabriken Gretsch Co. GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1978, Ser. No. 954,128

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756525

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **38 Claims**



1. A ski brake arrangement comprising a ski brake having at least one brake arm, said ski brake being detachably associated with a base plate of a ski binding; a second plate having upper surface means adapted in operation to support a part of the sole of a ski boot, said second plate being connectable to and detachably associated with the base plate by means of cooperating clip elements provided respectively on said second plate and said base plate, and support means defined between said base plate and said second plate for detachably receiving pivot axle means associated with said brake arm with said pivot axle means disposed substantially parallel to the upper surface of said base plate and substantially transverse to the longitudinal direction thereof, whereby to support said brake arm for corresponding pivotal movement.

4,230,338

SAFETY SKI BINDING

Erwin Weigl, Brunn, and Karl Stritzl, Vienna, both of Austria, assignors to Polyair Produkt Design Gesellschaft m.b.H., Kittsee, Austria

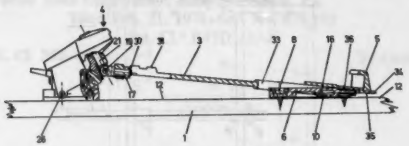
Filed Nov. 30, 1978, Ser. No. 965,040

Claims priority, application Austria, Dec. 6, 1977, 8739/77

Int. Cl.³ A63C *9/081*

U.S. Cl. 280—618 **14 Claims**

1. A safety ski binding comprising a soleplate, a toe holder, which is disposed at a forward end of the soleplate and cooperates with the toe portion of the boot, and a releasing device, which cooperates with the rear end of the soleplate and permits a release of the skiing boot, wherein the soleplate is pivoted to an adapter on an axis which is substantially transverse to the longitudinal direction of the soleplate and said adapter is adapted to be pivoted to the ski for a movement together with the soleplate about an axis which is at right angles to the plane of the soleplate, characterized in that a spring-biased releasing device (4) is adapted to be pivotally moved in vertically upward and lateral directions, the soleplate is mounted on a pivot



(16) which is transverse to the longitudinal direction of the soleplate (3) and displaceable in said longitudinal direction, and the rear end of the soleplate (3) is connected to the releasing device (4) by an articulated joint, which is inseparable under operating conditions.

4,230,339

COLLAPSIBLE WHEEL-CHAIR UNDERCARRIAGE

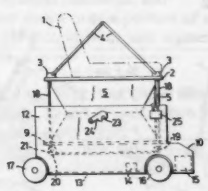
Emil Edholm, S-74041 Morgongava, Sweden

Filed Jun. 29, 1978, Ser. No. 920,626

Claims priority, application Sweden, Jun. 30, 1977, 7707563

Int. Cl.³ B62B *3/00*

U.S. Cl. 280—647 **9 Claims**



1. A collapsible wheelchair undercarriage which comprises a seat attachment, a wheeled chassis and collapsible intermediate members movably supporting said seat attachment on said wheeled chassis, said seat attachment being provided with means for suspending said wheelchair undercarriage, and hauling strap means located between and attached to said seat attachment and said chassis for lifting and lowering said chassis relative to said seat attachment.

4,230,340

TRAILER FOR COUPLING TO ROAD VEHICLES

Francois Wasservogel, Treffort, 01370 Saint-Etienne-du-Bois, France

Filed Dec. 18, 1978, Ser. No. 970,535

Int. Cl.³ B62B *5/00*

U.S. Cl. 280—656 **4 Claims**

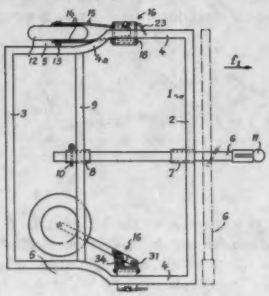
1. A trailer for motor vehicles, comprising:

a substantially flat bed having a first portion of predetermined width and a narrower rear portion having side edges spaced inwardly of the side edges of said first portion to define clearance spaces at the rear edges of said bed;

a tow bar removably secured to said bed;

a pair of ground wheels and mounting means pivotally mounting said ground wheels to said bed for pivotal movement about fore-and-aft axes below and adjacent the side edges of said first portion, each of said mounting means extending rearwardly from its axis whereby said

wheels and mounting means may be selectively pivoted about said axes to position said wheels in running position



below said clearance spaces or folded position within the outline of said rear portion of said bed.

4,230,341

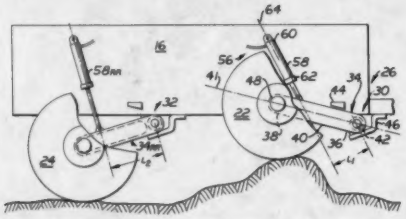
VEHICLE SUSPENSION SYSTEM

Cullen P. Hart, and Thomas C. Meisel, Jr., both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 25, 1978, Ser. No. 945,270

Int. Cl.³ B60G *17/04*

U.S. Cl. 280—702 **5 Claims**



1. A suspension system for a vehicle (10) having front (18,22) and rear (20,24) ground engaging wheels, comprising:

a frame (12) having a left member (14) with front and rear axle openings therein and a right member (16) with front and rear axle openings therein;

a front axle (50) extending between the left and right frame members (14,16) with its end portions protruding through the front axle openings;

a rear axle (50) extending between the left and right frame members (14,16) with its end portions protruding through the rear axle openings;

a speed differential (52) drivingly connected to the axles (50);

pivot means (30) for individually, pivotally mounting each of said wheels (18,20,22,24), said pivot means (30) including a plurality of pivotal bearings (42); and

a plurality of lever arms (34) each having a first end portion (36) connected to the frame (12) by a respective pivotal bearing (42) and pivotally connected to a respective end portion of the axles (50), a second end portion (38) rotatably connected to a respective one of the wheels (18,20, 22,24) and an inner portion (38), each of said wheels (18,20,22,24) being driven through the respective inner portion (38) of the lever arm (34) by the axles (50) and speed differential (52); and

fluid control means (56) associated with each of the wheels (18,20,22,24) including a plurality of fluid cylinders (58) each having a first end portion (60) pivotally connected to the frame (12) and a second end portion (62) pivotally connected to a respective lever arm (34), said cylinders (58) being angularly oriented from the vertical whereby the ratio between the cylinder displacement and wheel displacement is proportionately reduced as the wheel is raised above the level vehicle position and increased as the wheel is lowered below the level vehicle position, said cylinders (58) attached to said left frame member (14) being in fluid communication with one another and said cylinders (58) attached to said right frame member being in fluid communication with one another, said fluid control means proportionately increasing the supporting force exerted on the frame by each wheel (18,20,22,24) in response to increasing downward movement of the wheel from a first location and proportionately decreasing the supporting force exerted on the frame by each wheel in response to increasing upward movement of the wheel from the first location, said frame (12) always moving elevationally less than one-half the height of an obstacle during movement of one of the wheels (18,20,22,24) over the obstacle.

4,230,342

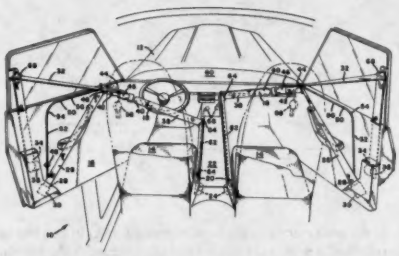
PASSIVE SEAT BELT SYSTEM

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 12, 1978, Ser. No. 924,026

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **11 Claims**



1. A vehicle passive seat belt restraint system comprising:

a seat belt adapted for restraining an occupant positioned in a seat in said vehicle, said seat belt comprising a lap portion adapted to be secured around the lap of said occupant and a shoulder portion adapted to be secured around the upper torso of said occupant;

a lap belt retractor mounted on a door of said vehicle adjacent to said seat, one end of said lap belt portion being wound on said lap belt retractor and the opposite end of said lap belt portion being connected to a connecting means positioned at a location spaced from said door;

a shoulder belt retractor mounted on said door, one end of said shoulder belt portion being wound on said shoulder belt retractor and the opposite end of said shoulder belt portion being connected to said connecting means whereby said lap and shoulder belt portions are connected to each other at a location spaced from said door;

said seat belt further comprising a connecting portion having a first end connected to said vehicle at the side of said seat opposite said door and a second end connected to said connecting means;

movable means slidably engaging said lap portion at a location intermediate its ends, said movable means permitting said seat belt to move therethrough;

track means mounted on said door, said movable means being movable in said track means;

means for moving said movable means from a first position at which said seat belt is in position to restrain said occu-

pant, to a second position at which said lap portion, said shoulder portion and said connecting portion of said seat belt are in non-restraining positions;

a second track means located in said vehicle at the side of said seat opposite said door and a second movable means movable in said second track means, said second movable means slidably engaging said connecting portion of said seat belt, said second movable means being movable from a first position adjacent the rear of said seat to a second position adjacent the front of said seat, said second movable means being in its first and second positions when said first movable means is in its first and second positions, respectively;

a seat belt retractor connecting said first end of said connecting portion of said seat belt to said vehicle at said opposite side of said seat; and

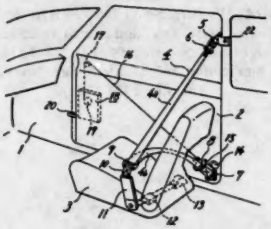
second moving means for moving said second movable means, movement of said movable means along said track means mounted on said door resulting initially in unwinding of said lap belt portion from said lap belt retractor, followed by unwinding of said connecting portion from its associated retractor, thereby permitting easy ingress to and egress from said seat.

4,230,343

PASSIVE VEHICLE PASSENGER RESTRAINT BELT SYSTEM

Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Jan. 25, 1979, Ser. No. 6,336
Claims priority, application Japan, Mar. 9, 1978, 53-029074
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—803 **4 Claims**



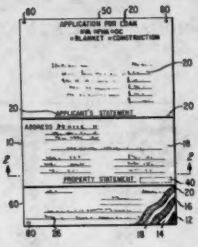
1. A passive vehicle passenger restraint belt system comprising a continuous belt having one end connected to the upper rear corner of a vehicle door and including a shoulder belt portion leading from that end to and passing freely through a control ring and a lap belt portion leading from the control ring to and passing freely through a transfer guide ring and thence to an anchor on the lower rear portion of the door; a control belt having one end connected to the control ring and leading from the control ring to a location inboard of and generally below and rearwardly of a passenger position on the seat and thence into an emergency locking retractor; a first flexible transfer element having one end secured to the transfer guide ring and the other end wound onto a winding device located on the lower rear portion of the door; and a second flexible transfer element having one end secured to the transfer guide ring and leading from the guide ring generally forwardly and upwardly along the door, around a guide element and thence to driving means for pulling the guide ring forwardly and upwardly along the door in response to opening motion of the door and for releasing the transfer guide ring for movement rearwardly and downwardly along the door by rewinding of the first transfer element on the winding device in response to closing motion of the door.

4,230,344

BUSINESS FORM WITH ELECTRICALLY CONDUCTIVE LAYER

Vincent G. Bell, Jr., Berwyn; Thomas P. Burke, Harleysville, both of Pa.; George D. Margolin, Newport Beach, and Victor V. Vurpillat, Laguna Niguel, both of Calif., assignors to Centurion Data Corporation, King of Prussia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,113
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—6 **31 Claims**



1. A business document comprising in combination:

a first layer;

a second layer overlying said first layer, said first and second layers having substantially different electrical conductivity and color; at least one of said layers is opaque to light;

one of said layers being electrically vaporizable upon exposure to an electrical discharge; and

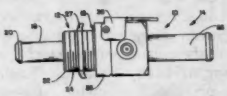
a third layer put down over a portion of said second layer organizing said second layer into segments.

4,230,345

COUPLING FOR VACUUM SYSTEMS

Wallace G. Boelkins, Grand Rapids, Mich., assignor to Uni-Mist, Inc., Grand Rapids, Mich.

Filed Dec. 6, 1978, Ser. No. 966,788
Int. Cl.² A47I *9/24*
U.S. Cl. 285—7 **19 Claims**



1. A vacuum system quick disconnect coupling, comprising:

a socket member including a body, said body having a front face and defining a through bore having a seat opening at said front face;

a cover having an outer and an inner face and depending ears;

pivot means on said socket member for pivoting said cover to said socket member;

a socket member seal dimensioned to seal said through bore at said front face;

a retainer extending through said seal for securing said seal to the inner face of said cover;

a plug member including a body defining a tubular nipple dimensioned to be received within said socket member through bore, said ears of said cover engaging and guiding said plug member during movement into said socket member through bore;

plug member seal means carried by said plug member and surrounding said tubular nipple, said seal means engaging said socket member front face and surrounding said through bore when said nipple is disposed within said through bore, said plug member seal means comprising a one-piece resilient member having a generally tubular portion defining a peripheral groove and terminating in a flat face, said resilient member dimensioned to seal against said seat; and

lock means on said cover for engaging and locking said plug member to said socket member when said nipple is disposed within said through bore.

4,230,346

ROOF DRAIN

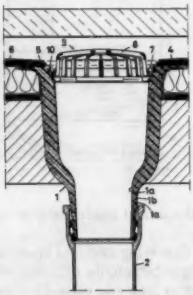
Klaus Göbel, Am Forst, 55 Trier-Irsch, Fed. Rep. of Germany

Division of Ser. No. 600,189, Jul. 29, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,403

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1974, 2437191

Int. Cl.[3] **E04D** *13/04;* **F16L** *5/02;* **B29D** *27/04*

U.S. Cl. 285—42 **4 Claims**



1. In a roof drain for installation in a roof subjected to varying ambient atmospheric temperatures for receiving water from the roof including a connection collar bondable to adjacent roofing material of the roof and having an aperture therein and a tubular drain body disposed with its drain channel substantially in alignment with the connection collar aperture and having on one end thereof an external flange adjacent to such connection collar aperture, the improvement comprising the drain body flange being joined by a contiguous integral liquidtight bonded joint to the margin of the connection collar aperture, said joint being leakproof over the range of ambient atmospheric temperatures to which the roof is subjected by such drain body flange being molded in contact with the connection collar aperture margin and because the drain body flange material and the collar aperture margin material, while different, have approximately equal coefficients of thermal expansion, which prevents appreciable differential expansion of the drain body flange and the connection collar aperture margin tending to rupture said joint therebetween.

4,230,347

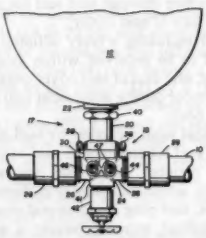
TEE CONNECTION FOR WELL WATER STORAGE TANKS

Clifford C. Williams, Iowa City, Iowa, assignor to Klasing Industries, Inc., Joliet, Ill.

Filed Mar. 13, 1978, Ser. No. 885,354

Int. Cl.[2] **F16L** *55/00*

U.S. Cl. 285—119 **9 Claims**



1. The combination of a water storage tank and a tank tee fitting for removably connecting the tank to a supply line that carries water from a source to a discharge point, said tank tee fitting comprising:

a pipe fitting having a hollow body, two integral tubular main branches extending longitudinally from said body in opposite directions, and a tubular side branch extending laterally from said body,

means on the outer ends of said main branches for connecting the branches in such a supply line,

a pair of contiguous tubular bosses on said body centrally thereof and communicating with the interior thereof, said bosses extending upwardly from the body at acute angles to the vertical and angularly with respect to each other,

means on said bosses for connecting a water pressure-responsive device to each of them in communication with the interior of said body,

a cylindrical tube having one end slidable in said side branch and removably received therein, said end having a peripheral groove formed therein,

means on the opposite end of said tube for connecting the tube to an inlet of said tank,

a sealing ring interposed between said side branch and said one tube end to seal the joint between the tube and the pipe fitting, and

set screw means in threaded engagement wiht said side branch and removably received in said groove in the tube to lock said joint,

whereby said tank is connectable to supply lines disposed at differing angles with respect to the tank, the tank may be disconnected from a supply line to which it is connected by loosening said set screw means to remove the same from said groove and removing said one end of the tube from said side branch, and a tank having said tube connected thereto thereafter may be connected to the supply line by reversing the latter procedure.

4,230,348

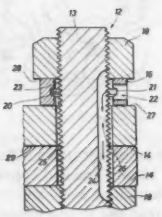
APPARATUS FOR SEALING FLANGE JOINTS

Vonnie S. Moore, Alvin, Tex., assignor to Team Inc., Alvin, Tex.

Continuation of Ser. No. 661,996, Feb. 27, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 927,585

Int. Cl.[2] **F16L** *13/00*

U.S. Cl. 285—297 **1 Claim**



1. An assembly for use with flanged connections with circumferentially spaced matching apertures in the mating flanges for receiving bolts to connect the flanges for enabling repair of the connection if leaks occur therein without disassembly or further necessary work on the assembly, comprising:

(a) at least one bolt mounted through an aperture in the flanges of the flanged connection, said bolt being formed to define an elongated slot intermediate the extremities thereof for extending into communication with the joint between the flanges of the flanged connection;

(b) an injection ring positioned about an end of said bolt, said ring have a semicircular channel in the inner periphery thereof and a radially extending injection aperture extending through the ring and communicating with one end of said channel

(c) lock nut means on said end of said bolt threadingly and sealingly connecting said injection ring on said bolt wherein said ring may be rotated relative to said bolt from an operative position where said slots are in registery with

said semicircular channel to an inoperative position where said channel and said slots are out of registery and communication of said sealant between said slot in said bolts and said channel in said ring is prevented; and

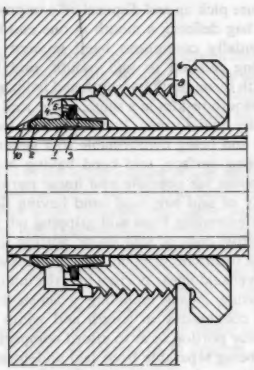
(d) a nut threadingly and sealingly engaging with a second end of said bolt for sealingly engaging with the outer surface of a flange of the flanged connection whereby threading said nut onto said bolt urges the assembly into sealing engagement and wherein said slot does not extend beyond said nut and lock nut means.

4,230,349

JOINT

Olov M. Normark, Astrakangtan 2, Vällingby, Sweden (S-162 32)

Continuation of Ser. No. 754,413, Dec. 27, 1976, abandoned. This application Oct. 30, 1978, Ser. No. 955,763
Claims priority, application Sweden, Dec. 30, 1975, 7514798
Int. Cl.³ F16L *19/08*
U.S. Cl. 285—342 **8 Claims**



1. A pipe coupling for interconnecting an embraced tubular member (9) and an embracing tubular member (8) telescoping one another to form a sealed interlocking joint therebetween, completely enveloped by said tubular members, comprising:

(a) flexible shim means (3) for application about said embraced member (9) and arranged to slide axially between said tubular members and having a bow-shaped smooth surface facing said embraced tubular member;

(b) a deformable substantially ovular bulging nose portion (2) connected to said shim means for engaging a camming surface connected with said embracing member and external surface of said embraced tubular member without biting into said external surface and said camming surface; and

(c) a force-applying means (6) engaging at least one of said members (8, 9) axially relative thereto, effective initially to slide said nose portion into engagement with said camming surface and to flatten the bow-shaped surface of said shim means against the surface of said embraced member and thereafter upon continued application of the sliding force to deform said nose portion (2) to form a compacted sealing portion interlocking said members (8, 9).

4,230,350

OVEN DOOR LATCH

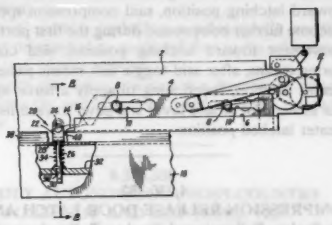
James W. Gee, and Richard J. Arntz, both of Cleveland, Tenn., assignors to Magic Chef, Inc., Cleveland, Tenn.

Filed Apr. 5, 1979, Ser. No. 27,446
Int. Cl.² E05C *1/06*
U.S. Cl. 292—144 **4 Claims**

1. In a range having an oven opening and a hinged door arranged to close said opening:

a bolt member slidably mounted on said range for movement along an edge of said opening;

a keeper on said door projectable into the path of movement of an end of said bolt when said door is closed;



said end of said bolt being of wedge shape to engage and urge said keeper inwardly; and

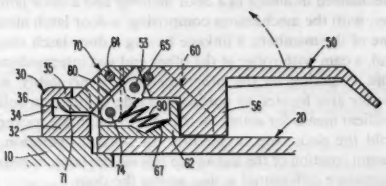
said keeper being resiliently mounted on said door for yieldable inward movement thereon when engaged by said wedge-shaped end of said bolt.

4,230,351

LINK AND LEVER OPERATED TOGGLE LATCH MECHANISM

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed May 15, 1978, Ser. No. 906,074
Int. Cl.³ E05C *3/08*
U.S. Cl. 292—223 **1 Claim**



1. A latching device for a door, said latching device comprising:

a. keeper means secured to the frame of the door;

b. pawl means, lever means, toggle link means and compression spring means mounted on said door in a position such that the nose portion of said pawl means may engage said keeper means when said door is moved toward and into closed position, said toggle link means connecting said pawl means to said lever means;

c. said pawl and lever means being structurally related to be rotated manually about first and second fixed pivot points and held between over-the-center latching and unlatching postions by said toggle link means;

d. said compression spring means engaging said toggle link means and adapted to bias said pawl and lever means in each of its over-centered latching and unlatching positions;

e. said keeper means having a recess for receiving the nose portion of said pawl means, said recess having an upper keeper portion against which the nose portion of said pawl means is adapted to bear;

f. said keeper means adapted to be engaged by the nose portion of said pawl means when said lever means is manually operated to move said pawl means to latching position;

g. said keeper means having a base portion which projects toward said pawl means relative to said upper keeper

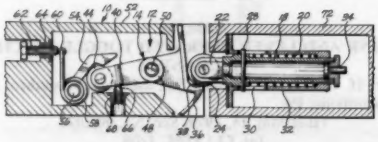
portion and is adapted to be engaged by the nose portion of said pawl when said lever means is in unlatched position and said door is moved or slammed toward shut position, said nose portion of said pawl engaging said projecting base portion and starting movement of said lever and pawl toward latching position, said compression spring means become further compressed during the first portion of said movement toward latching position, said compression spring means, after said toggle link means passes through center position, functioning to apply a force to continue the movement of said lever and pawl toward its over-the-center latched position.

4,230,352

DECOMPRESSION RELEASE DOOR LATCH AND STOP

Francis Sealey, Bellevue, and Stephen T. Steadman, Redmond, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Apr. 2, 1979, Ser. No. 26,102
Int. Cl.³ E05B *15/00*; E05C *19/02*
U.S. Cl. 292—341.17 **13 Claims**



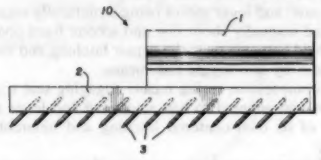
1. A pressure responsive release door latch and latch stop mechanism mounted in a door member and a door jamb member, with the mechanisms comprising: a door latch mounted to one of the members; a linkage having a door latch stop at one end, a cam with roller at the other end and intermediate pivotable mounting to the other member; a pivotably mounted rocker arm located to contact the side of the cam roller; and resilient means for acting on the cam through the rocker arm to hold the door stop in position for normal operation and to permit rotation of the linkage to release the latch in response to a pressure differential acting across the door.

4,230,353

CARPET DOOR STOP

Keith D. Bjorgum, 2341 Estrellita Way, Sacramento, Calif. 95825

Filed May 3, 1978, Ser. No. 902,432
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—343 **2 Claims**



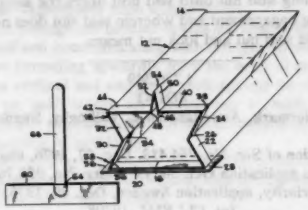
1. A door stop for use in carpeted rooms comprising a handle member, a base member disposed on and below said handle member, said base member having substantially planar and parallel top and bottom portions and perpendicular planar side walls therebetween and means to engage a carpet in the room to provide resistance to a door being opened when one of the said side walls is placed in proximate position to a vertical face of the door.

4,230,354

PICK UP AND DISPOSAL KIT FOR PET ORDURE

Eleanor Claras, 239 Greenmeadow Way, Palo Alto, Calif. 94306

Filed Oct. 26, 1978, Ser. No. 955,014
Int. Cl.³ A01K *29/00*; A47L *13/52*
U.S. Cl. 294—1 B **4 Claims**



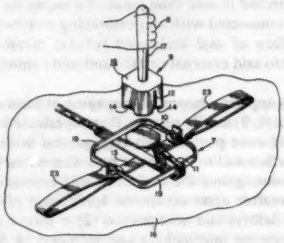
1. An ordure pick up and disposal kit comprising an impervious flexible bag defining a mouth at one end thereof, a semi-rigid substantially continuous band secured to said bag in circumscribing relation to said mouth, said band having a uniform width throughout its length and having a straight edge so that said mouth resides in a single plane, said band including a substantially undeformed linear portion having first and second ends and being conformable to a generally planar ordure supporting surface, said band having means forming a foldable gripping tab opposite said linear portion and extending exteriorly of said bag, said band having first and second side portions extending from said gripping tab forming means to the respective ends of said linear portion for spacing said linear portion from said gripping tab, and means for transporting ordure over said linear portion into the interior of said bag, said transporting means including a substantially rigid ply substantially coextensive in length and width with said undeformed linear portion so as to afford compact storage of the kit, said ply being separable from said undeformed linear portion for effecting ordure transport over said linear portion into the interior of said bag.

4,230,355

TRAPPERS TOOL AND METHOD OF USE

Raymond W. Petrunich, 1121 Sloan St., Scranton, Pa. 18504

Filed Sep. 13, 1979, Ser. No. 74,925
Int. Cl.³ B25B *27/00*
U.S. Cl. 294—15 **9 Claims**



1. A tool for handling cocked animal traps and the like, said traps of the type which operate by contact of an animal with a pan mounted on the frame of the trap, said contact causing release of a triggering dog, which allows operation of spring-loaded animal-holding means, said tool comprising:

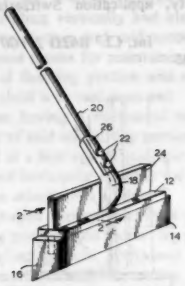
an enclosure member adapted to overfit the pan of the trap;

a handle member for said enclosure member, said handle member having a length greater than the span of the jaws of the trap.

4,230,356
TILE-GROUT APPLICATOR

John D. O'Connor, 19720 NW. 5th Ave., Miami, Fla. 33169

Filed Oct. 23, 1978, Ser. No. 953,852
Int. Cl.[3] A47F *13/06*
U.S. Cl. 294—19 R 3 Claims



1. A tool useful for applying grouting, comprising:
a rigid supporting bar having an upper surface and a lower surface, said bar including an elongated flange disposed outwardly and substantially perpendicular to the lower surface;
a handle;
means connected to the upper surface of said support bar for connecting said handle to said support bar; and p1 a flexible blade, said blade including an upper surface and a lower surface, said blade having a groove disposed in said upper surface, said groove length being substantially the length of said support bar flanged such that said flange may fit in said groove when said blade is stretched to firmly hold said blade to said support bar, said lower surface of said blade being tapered in shape to provide a blade angle of from 30 degrees to 45 degrees.

4,230,357
TOOL FOR MANUAL RELOCATION OF ELECTRICAL CABLES

Mahlon L. Bosch, and Marvin D. McKelvy, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

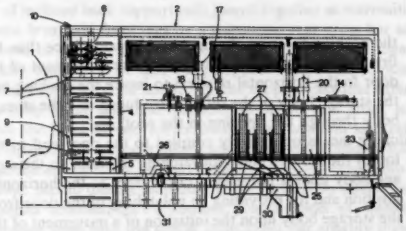
Filed Jan. 5, 1979, Ser. No. 1,169
Int. Cl.[3] B25B *27/00*
U.S. Cl. 294—19 R 3 Claims

1. A cable tool, comprising:
an elongated rod;
cable pick up structure secured to said rod adjacent one end thereof and including
a pair of cable-lifting fingers fixedly attached to said rod and in spaced, generally opposed relationship to one another, each of said fingers having an arcuate section and a terminal section,
said terminal section including a substantially rectilinear segment oriented at an angle relative to the adjacent portion of said arcuate section,
said segments also being oriented in a downward direction, away from the end of said rod, and inwardly toward one another.

4,230,358
HIGHLY AUTONOMOUS CROSS-COUNTRY WORKSHOP AND SERVICING VAN

Paul E. R. Legueu, 85 Av. de Mazy, 44380 Pornichet, France

Filed Jul. 12, 1978, Ser. No. 923,893
Claims priority, application France, Jan. 11, 1978, 78 00640
Int. Cl.[3] B60P *3/14*
U.S. Cl. 296—24 R 8 Claims



1. A highly autonomous cross-country workshop and servicing van intended to travel in regions devoid of service and repairing stations for automobile vehicles, said van comprising:
(a) chassis means;
(b) a driving cab and body mounted upon and interconnected by said chassis, said body comprising a front end wall adjacent said cab but spaced therefrom and having passage openings formed therein;
(c) an electric generating set removably mounted on said vehicle between said cab and said front wall by means of skis, releasable fixing means connecting said skis to said generating set, said set being thereby capable of being used on the ground in an autonomous manner;
(d) equipment fixed inside said body; and
(e) power transfer lines and pipes connecting said generating set to said equipment, said power transfer lines and pipes passing through said passage openings in said front end wall.

4,230,359
FRONT END LOADER

Fred T. Smith, Palos Verdes Peninsula, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

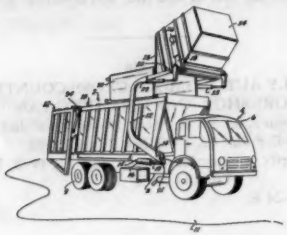
Division of Ser. No. 711,876, Aug. 5, 1976, Pat. No. 4,088,234, which is a division of Ser. No. 497,129, Aug. 12, 1974, Pat. No. 3,988,979. This application Mar. 16, 1978, Ser. No. 887,037
Int. Cl.[3] B60P *7/02*
U.S. Cl. 296—101 10 Claims

1. In combination in a refuse loader,
a refuse storage body having a roof and having an opening in the roof,
a door movable to open and close the opening in the roof,
means for supporting the door for pivotable movement between a horizontal position closing the opening and a vertical position exposing the opening,

hydraulic means operatively coupled to the support means for providing a movement of the door between the horizontal and vertical positions,

means operatively coupled to the hydraulic means for providing a first positive force on the door during the movement of the door to the horizontal position to provide for a packing into the storage body of refuse introduced into the storage body through the opening in the roof,

means operatively coupled to the hydraulic means for increasing, automatically and without manual intervention,



the positive force on the door to a greater force than the first positive force near the end of the movement of the door to the horizontal position to insure the packing into the storage body of the refuse introduced into the storage body through the opening in the roof, and

latching means operatively coupled to the door and to the top of the storage body for latching the door to the storage body upon a movement of the door to the horizontal position and for providing an unlatching of the door from the storage body upon the initiation of a movement of the door to the opened position.

4,230,360

BULK MATERIAL BED

Leonard J. Eisenman, Box A, Eisenman Rd., Boise, Id. 83706

Filed Mar. 6, 1979, Ser. No. 17,946

Int. Cl.³ B62D *27/00*

U.S. Cl. 296—181 **16 Claims**

1. A bulk material bed comprising:

parallel elongated side walls joined on opposite ends by front and rear end walls and a bottom wall joining lower edges of the side and end walls;

horizontal top rails extending along the elongated side walls;

first diagonal truss members each affixed at a top end to a top rail adjacent the front end wall and extending therefrom angularly downward to a bottom end elevationally below the bottom wall and located adjacent the longitudinal center of the bed;

second diagonal truss members each affixed at a top end to a top rail adjacent the rear end wall and extending therefrom angularly downward to a bottom end elevationally below the bottom wall of the bed and located adjacent the longitudinal center of the bed;

structural means operatively connecting the respective bottom ends of said first and second diagonal truss members to one another; and

web members interconnecting the top rails and said truss members.

4,230,361

VEHICLE BODY CONSTRUCTION

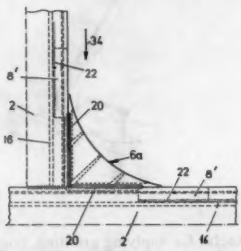
Roland Nachbur, Turgi, and Dieter Faisst, Zurich, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 30, 1978, Ser. No. 955,772

Claims priority, application Switzerland, Nov. 3, 1977, 13414/77

Int. Cl.³ B62D *27/00*

U.S. Cl. 296—193 **19 Claims**



1. A vehicle body construction for use in a vehicle having at least one wheel axle comprising a plurality of horizontal and vertical extending metal sections connected together, the improvement comprising:

a first horizontal metal section having a first guide means;

a second horizontal metal section having a second guide means, said second horizontal metal section being disposed substantially parallel to said first horizontal metal section;

a first vertical metal section having a third guide means and a forth guide means, said first vertical metal section being disposed substantially perpendicular to and extending between said first and said second horizontal metal sections;

connecting means for securing said first vertical metal section to said first and said second horizontal metal sections;

said connecting means including fifth guide means for matingly engaging said first guide means with said third guide means and said second guide means with said fourth guide means.

4,230,362

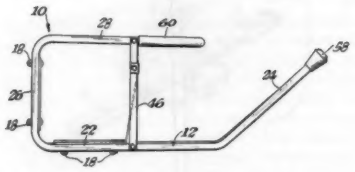
CHILD'S TABLE SEAT

George J. Euwema, 1880 NW. 40th Ct., and George W. Euwema, 1920 NW. 40th Ct., both of Fort Lauderdale, Fla. 33309

Filed Dec. 11, 1978, Ser. No. 968,383

Int. Cl.³ A47B *39/00*

U.S. Cl. 297—174 **3 Claims**



1. A table seat for a child, comprising:

a frame means including a pair of generally U-shaped support members in spaced relation to each other and an angularly upward disposed bearing leg extending from said support members;

each said generally U-shaped support members having a first leg portion, a second leg portion generally parallel to said first leg portion, and an upwardly extending portion connecting said first leg portion to said second leg portion;

a seat means secured transversely between the pair of said first leg portion of said support members at the rearward end of said first leg portion, said seat means including a forward and rear portion;

a back means secured between the pair of said upward extending portion of said U-shaped support members;

a brace means extending vertically and attached between each said first leg portion and said second leg portion, forward of said seat means for maintaining a spaced relation between said first leg portion and said second leg portion when a child is in said seat; and

a restraining means having a horizontal member secured between the pair of said second leg portion and a vertical member secured at a first end to said seat means and at a second end to said horizontal member for keeping a child in said seat when attached to a table;

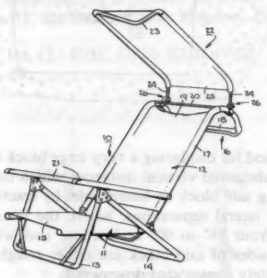
said generally U-shaped support members positioned with each said first leg portion, said second leg portion and said upwardly extending portion positioned in a diverging manner from the rear of said seat means.

4,230,363

CANOPY FOR FURNITURE FRAMES

Donald J. Borichevsky, Wells, Vt., assignor to The Telescope Folding Furniture Co., Inc., Granville, N.Y.

Filed May 5, 1978, Ser. No. 903,114
Int. Cl.³ A47C 7/10
U.S. Cl. 297—184 **7 Claims**



1. The combination of

a collapsible furniture frame having a pivotally mounted back rest portion including a frame having a back support surface and an end portion terminating in a plane spaced from the plane of said back supporting surface, said end portion including a pair of parallel portions, a cross-bar connecting said parallel portions together at the ends thereof and a stiffening rod secured within and to said parallel portions;

a canopy pivotally mounted on said end portion of said furniture frame, said canopy including a skeletal frame having a pair of parallel legs; and

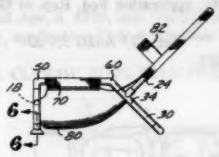
means for pivotally mounting said canopy to said end portion, said means including a pair of clamps, each said clamp including a one piece plate disposed about a respective parallel portion of said backrest end portion and having a slot receiving said stiffening rod to locate said plate, a bolt passing through two ends of said plate and a respective one of said canopy legs, and means threaded on said bolt to tighten said plate ends against said respective canopy leg.

4,230,364

MULTIPURPOSE CHAIR

Charles F. Parker, 2041 Tevis Ave., Long Beach, Calif. 90815

Filed Apr. 12, 1978, Ser. No. 895,813
Int. Cl.² A47C 7/00, 31/00
U.S. Cl. 297—468 **9 Claims**



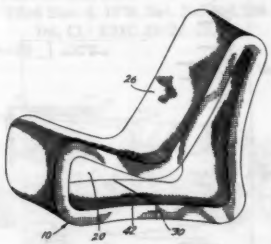
1. A portable chair constructed of water insensitive materials and having a pair of front legs joined by a transverse front cross bar and terminating in lower extremities equipped with suction devices for vacuum adhesion to a floor wherein said front cross bar is located well above the level of said floor, a pair of inclined back support rails joined together at extremities remote from said front legs by a transverse rear cross bar and oriented to provide supine back support, rear support means directly connected to said back support rails and providing rear support relative to said floor, side support rails that extend forwardly from said rear support means to said front legs above the level of said forward cross bar wherein said rails, said legs and said support means are all joined together in fixed immobile arrangement, and are constructed of short sections of hollow, plastic tubing, including joints formed by elbows and T-shaped sections, and a flexible porous sheet of webbing extending from said transverse front cross bar sharply downward to a level closely approaching said floor immediately behind said suction devices and from there upward and rearward to said rear cross bar and upward laterally to said side support rails.

4,230,365

ARTICLE OF FURNITURE AND METHOD OF MANUFACTURE

Alexander Messinger, 3725 Lankenau Rd., Philadelphia, Pa. 19131

Filed Jan. 18, 1979, Ser. No. 4,438
Int. Cl.² A47C 7/02, 27/00
U.S. Cl. 297—457 **21 Claims**



1. An article of furniture, comprising:

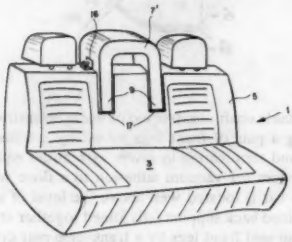
a self-supporting peripheral frame, defining a body contour and an open central region, the entire frame bordering said open region; and,

a fabric sleeve, substantially covering said peripheral frame and providing a body support surface.

4,230,366
AUTOMOTIVE SEAT WITH BUILT-IN CHILD RESTRAINT

Günter Ruda, Wettstetten, Fed. Rep. of Germany, assignor to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,779
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803574
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—487 **15 Claims**



1. In combination with an automotive-vehicle seat having a seat part with an upper sitting surface and a back part with a front leaning surface, a child restraint comprising:

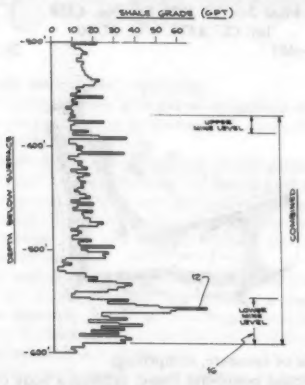
a rigid U-shaped bar element; and

means for displacing said bar element relative to said parts between a use position above said upper surface, open backwardly, and in front of said front surface and a storage position generally level with one of said surfaces, whereby a child sitting on said seat behind said bar in said use position is surrounded by said bar.

4,230,367
METHOD OF OBTAINING OIL FROM OIL SHALE DEPOSITS

Harry E. McCarthy, Golden, Colo., assignor to Science Applications, Inc., La Jolla, Calif.

Filed Apr. 7, 1978, Ser. No. 894,330
Int. Cl.[3] E21C *41/10*
U.S. Cl. 299—2 **10 Claims**



1. A process for extracting oil and/or gas from an oil shale formation having at least one generally horizontally extending layer of oil-rich shale having a grade of at least 25 gallons of oil per ton, and being predominantly formed of kerogen phase continuous oil shale, with most of the rest of said formation being of a lesser grade, comprising the steps of:

excavating said generally horizontally extending layer of oil-rich shale;

excavating a second generally horizontally extending layer of oil shale in general vertical alignment with said first

leaving pillars to support said formation, with the pillars comprising less than forty per cent of the volume of each of said layers;

explosively rubblizing the oil shale in said pillars and between said two sections; so that there are no regions within the rubblized mass having substantial volumes of kerogen phase continuous oil shale which could compress and block gas flow;

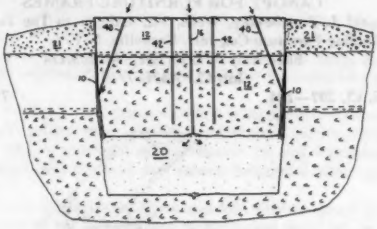
retorting the rubblized oil shale in situ to obtain oil therefrom; and

retorting said excavated oil-rich shale above ground.

4,230,368
METHOD FOR DISPLACING LARGE BLOCKS OF EARTH

James M. Cleary, Jr., 92 McCallum Dr. - Box 541, Falmouth, Mass. 02541

Filed Feb. 12, 1979, Ser. No. 11,631
Int. Cl.[3] E21C *41/04, 41/12*
U.S. Cl. 299—2 **28 Claims**



1. A method for displacing a very large block of earth materials over substantial vertical distances which comprises:

delineating said block on lateral sides by fracturing and (or) cutting lateral separations, where the lateral sides may range from 35° to 90° inclination, and where opposite lateral sides of said block are either roughly parallel of moderately convergent downward;

filling said lateral separations with a gelled slurry whose density exceeds 1600 kg/m^3 for the major portion of the displacement, where the slurry is composed principally of water and locally excavated solids in a broad size range including clay, silt, and sand; and

causing substantial upward displacement of the block by feeding pressurized fluid to the underside of the block.

4,230,369
PAVEMENT PLANING METHOD AND APPARATUS

Raymond A. Gurries, Reno, Nev., assignor to The Gurries Company, Sparks, Nev.

Continuation-in-part of Ser. No. 873,249, Jan. 30, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 973,163
Int. Cl.[2] A01B *35/00*; E01C *23/09*
U.S. Cl. 299—14 **30 Claims**

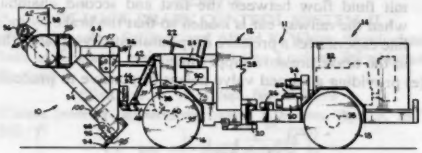
1. A pavement planer comprising:

a transversely elongated cutter blade disposed at an acute angle between 45° and 55° to the surface of a pavement, the cutter blade extending in a downward and foward direction along a cutting plane to a cutting edge that lies in the cutting plane;

a support frame;

means for mounting the cutter blade on the support frame to permit reciprocation approximately in the cutting plane;

means mounted on the support frame for intermittently applying a unidirectional force at sonic frequency to the cutter blade parallel to the cutting plane in the forward direction; and



means for continuously transporting the frame in the forward direction while applying the unidirectional force to advance the cutter blade incrementally in the forward direction when the cutter blade engages a pavement.

4,230,370

EQUIPMENT FOR LAYING ELONGATE MATERIAL

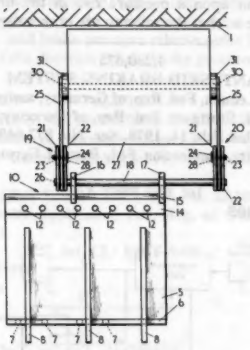
Brian W. Cartledge, Codnor; Barry Millhouse, Stonebroom, and Michael E. Cheese, Underwood, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jan. 11, 1979, Ser. No. 2,643

Claims priority, application United Kingdom, Feb. 28, 1978, 07869/78

Int. Cl.[2] E21C *35/20*; E21D *19/02*

U.S. Cl. 299—33 **10 Claims**



1. Equipment for laying a layer of elongate material adjacent to a newly exposed rock or mineral surface formed by a mining machine cutter as the machine traverses along a working face, comprising a support bracket for fixed attachment to the mining machine, the support bracket providing a horizontally extending slideway, a slide component slidable along the slideway for movement transverse to the direction of machine traverse, securing means for fixing the position of the slide component along the slideway, support arm means extending from the slide component, the support arm means constituting storage means for a coil of elongate material such that in use as the machine traverses along the working face the elongate material is unwound from the coil and laid adjacent to the newly exposed rock or mineral surface.

4,230,371

EQUIPMENT FOR LAYING A LAYER OF ELONGATE MATERIAL

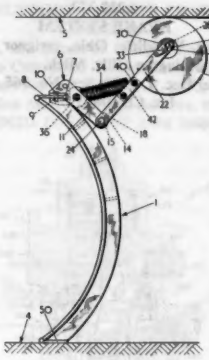
Roy L. Bell; Dennis A. Gillard, both of Burton-on-Trent; Peter Watt, Newark; Brian Cartledge, Codnor; Barry Millhouse, Stonebroom; Michael E. Cheese, Underwood, and Eric Dring, Pleasley, all of England, assignors to Coal Industry Limited, London, England

Filed Apr. 6, 1979, Ser. No. 27,699

Claims priority, application United Kingdom, Apr. 11, 1978, 14197/78

Int. Cl.[2] E21C *35/20*; E21D *19/02*

U.S. Cl. 299—33 **6 Claims**



1. Equipment for laying a layer of elongate material adjacent to a newly exposed rock or mineral surface formed by a mining machine cutter as the machine traverses along the working face, a loading member for cut rock or mineral being positioned adjacent to the rear of the cutter, comprising support bracket means fixedly securable to the loading member, arm means pivotally mounted on the support bracket means and constituting support means for a store of elongate material, and means for urging the arm means towards said newly exposed rock or mineral surface formed by the mining machine cutter such that in use as the machine traverses along the working face elongate material is dispensed from the store and laid adjacent to the newly exposed rock or mineral surface.

4,230,372

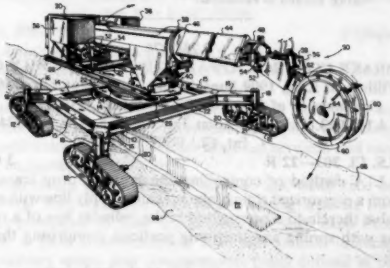
DUAL ROCK CUTTER WHEEL TRENCHER

Edward N. Marten, Von Ormy, Tex., assignor to H. B. Zachry Company, San Antonio, Tex.

Filed Dec. 4, 1978, Ser. No. 966,338

Int. Cl.[2] E21C *29/24, 25/16*

U.S. Cl. 299—39 **10 Claims**



1. Apparatus for cutting a trench in rock comprising:

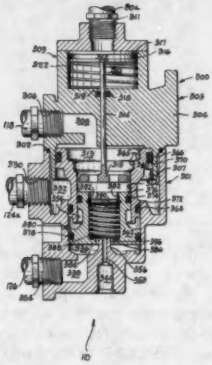
a supporting base,
traction means carried by and movably supporting said base,
a turntable carried by said base by means for translatably moving said turntable relative to said base,
an extendable boom pivotally supported by said turntable, whereby said boom may pivot about a horizontal axis,
means for rotating said boom about its longitudinal axis, and
a double rock cutter carried by said boom, said rock cutter including a pair of rock cutter wheels attached to a shaft, said shaft having a length, and said boom having a width less than the maximum distance between outside teeth on said cutter wheels.

4,230,373

BRAKE SYSTEM

Ronald S. Plantan, Wickliffe, Ohio, assignor to White Motor Corporation, Farmington Hills, Mich.

Filed Dec. 1, 1978, Ser. No. 965,416
Int. Cl.³ B60T *8/26*
U.S. Cl. 303—7 **23 Claims**



20. A brake proportioning system for the tractor unit of a tractor trailer type vehicle comprising:
(a) a source of pressurized fluid;
(b) fluid pressure operated brake actuators for engaging front and rear wheel brakes on said tractor;
(c) front and rear valve means for controlling the flow of pressurized fluid from the source to the front and rear brake actuators respectively;
(d) fluid pressure proportioning means responsive to trailer-unattached and trailer-attached conditions;
(e) at least one flow control member in said fluid proportioning means for reducing the output pressure of one of said valve means when said fluid proportioning means is sensing one of said conditions; and
(f) fluid biasing means urging said flow control member towards a position wherein the output pressure of the one valve means is reduced.

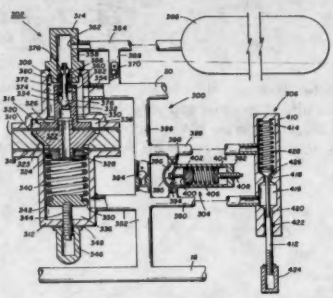
4,230,374

BRAKE CONTROL APPARATUS FOR RAILWAY CARS

William R. King, 1909 Sunshine Sq., Longview, Tex. 75601

Continuation of Ser. No. 775,379, Mar. 7, 1977, Pat. No. 4,143,923. This application Jul. 12, 1978, Ser. No. 924,068
Int. Cl.³ B60T *8/18*
U.S. Cl. 303—22 R **3 Claims**

1. A method of controlling the pressure drop transmitted from a pressurized train brake pressure supply line with a brake valve therein to a pressurized brake cylinder line of a railway car with sprung and unsprung portions, comprising the steps of:
(a) connecting a first chamber to the brake pressure supply line;
(b) connecting a second chamber to the brake cylinder line;
(c) movably abutting the first and second chambers with diaphragm means having surfaces of different areas, with the relatively larger are abutting the second chamber;
(d) interconnecting the first and second chambers with a first valve means responsive to the relative positioning of the sprung and unsprung portions of the railway car, which positioning corresponds to the loading condition, to permit fluid flow between the first and second chambers when the railway car is loaded so that the brake cylinder line experiences a pressure drop substantially equal to that in the brake pressure supply line;
(e) providing a second valve means responsive to predetermined positioning of the diaphragm means to permit fluid flow between the first and second chambers while the first valve means is closed and the diaphragm means is unbalanced so that the brake cylinder line on an unloaded railway car experiences a pressure drop relatively smaller than that experienced in the brake pressure supply line by the inverse ratio of surface areas of the diaphragm means abutting the second and first chambers, respectively; and
(f) interconnecting the first and second chambers with a first check valve means responsive to pressure differential for equalization upon a pressure rise in the brake pressure supply line so that the railway car brakes can be released.

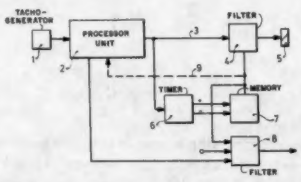


4,230,375

ANTI-SKID BRAKING SYSTEM

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,648
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706278
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—105 **10 Claims**



1. An anti-skid braking system for a vehicle having wheel brakes including a pressure inlet valve and including:
a wheel motion transducer, associated with a vehicle wheel, for generating wheel signals related to wheel rotation;
a brake force generator for actuating said wheel brakes with variable force;
a processor unit for receiving said wheel signals from said wheel motion transducer and for generating first control signals for said brake force generator;
at least one signal filter for receiving said first control signals from said processor unit and for generating second control

signals which are selectively timed with respect to said first control signals; and

a timing circuit for receiving said first control signals and for generating filter switching signals which are applied to said signal filter to change the time constant thereof and cause said selective timing of said second control signals.

4,230,376

ANTI-LOCK BRAKE CONTROL SYSTEM II

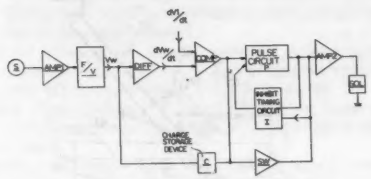
Malcolm Brearley, Solihull, and Alfred K. White, Birmingham, both of England, assignors to Girling Limited, Birmingham, England

Filed Apr. 5, 1978, Ser. No. 893,799

Claims priority, application United Kingdom, Apr. 5, 1977, 14239/77

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—106 **11 Claims**



1. An anti-lock brake control system for vehicles with braked wheels comprising a wheel speed sensor for producing a signal proportional to wheel speed, a differentiator that receives the wheel speed signal from said sensor and produces a corresponding acceleration/deceleration signal, a comparator that receives said acceleration/deceleration signal and responds by producing an output pulse while said acceleration/deceleration signal exceeds a predetermined deceleration threshold, a pulse circuit that is triggered by said output pulse signal and produces a brake pressure release pulse of a predetermined maximum duration, and an inhibit timing circuit that inhibits re-triggering of the pulse circuit for a predertimined duration after said brake pressure release pulse has terminated irrespective of the duration of said brake pressure release pulse.

4,230,377

PRESSURE CONTROL VALVE UNIT

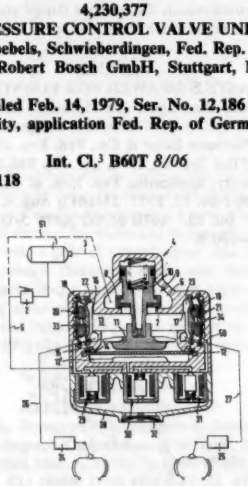
Hermann J. Goebels, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,186

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810151

Int. Cl.³ B60T *8/06*

U.S. Cl. 303—118 **11 Claims**



1. A pressure control valve unit for an anti-locking protection apparatus in motor vehicle wheel brakes control pressure means which is actuable in direct proportion to a reactive pressure in a pressure exchange chamber attachable on one side to a reserve supply line and on the other side to a relief point and which control pressure controls the brake pressure in at least one wheel brake cylinder, a valve unit housing, said pressure exchange chamber positioned in said valve unit housing, a switching diaphragm in said pressure exchange chamber, relay valve means having a switching member under control pressure on one side of said switching diaphragm and a monitor member for a brake cylinder line communicating with the outside air on the other side of said switching diaphragm.

4,230,378

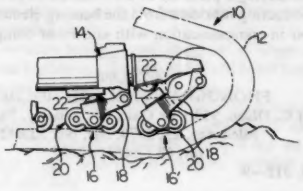
RESILIENT SUPPORT PAD FOR CRAWLER TYPE VEHICLES

Robert J. Purcell, and James R. Sturges, both of Washington, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 785,625, Apr. 7, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 886,185

Int. Cl.² B62D *55/16*; F16F *1/44*; B60G *11/22*

U.S. Cl. 305—22 **24 Claims**



1. A unitary resilient support pad (**22**) for use on a vehicle (**10**), the support pad (**22**) comprising:

a base portion (**24**), an intermediate portion (**26**), and a cap portion (**28**) each of a generally round horizontal cross sectional configuration and defining an overall height Ht, the base portion (**24**) being of a columnar configuration and having a preselected height Hb, the intermediate portion (**26**) having outer annular walls (**34**) sloping generally inwardly, the cap portion (**28**) being of a general domed configuration, and the preselected height Hb of the base portion (**24**) being in a range of about 3.5% to about 26% of the overall height Ht; and wherein the base portion (**24**) has a bottom surface (**25**) having a preselected area defined by the expression "Area = T/C" wherein:

C = a constant in a range of about 3500 to about 8300 kPa.

T = total weight of the vehicle (**10**) upon which the pad (**22**) is to be used.

4,230,379

ANTIFRICTION BEARING CONSTRUCTION

Sören E. H. Edström, Uppsala, Sweden, assignor to Kockums Industri Aktiebolag, Sweden

Filed Nov. 17, 1978, Ser. No. 961,688

Claims priority, application Sweden, Nov. 17, 1977, 7712980

Int. Cl.³ F16C *33/66*

U.S. Cl. 308—187 **2 Claims**

1. An antifriction bearing assembly comprising:

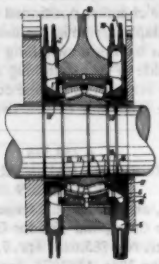
(a) an annular outer race adapted to be supported for orbiting about an axis remote therefrom;

(b) an inner annular race disposed in said outer race and defining an annular lubricant-receiving space therewith;

(c) antifriction bearing elements disposed between said races in engagement therewith;

(d) wall means in fluid-tight relation to said outer race and orbital therewith, said wall means having separate inner compartments in fluid communication with each other, and in fluid communication with said annular lubricant-receiving space, said compartments being defined in part by radially extending circumferentially spaced flanges secured to said wall means; and

(e) a series of inserts secured to said wall means which respectively define with inner surfaces of said compartments a series of lubricant channels opening toward each other



into the annular lubricant-receiving space, and said inserts also having a plurality of lubricant holes therethrough for conducting lubricant from the bearing elements to a reservoir in communication with said inner compartments.

4,230,380

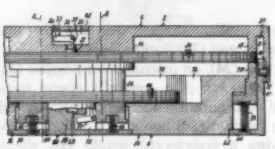
PHONOGRAPH RECORD HOLDER

Richard C. Olson, 913 Fair Oaks Ct., Liberty, Mo. 64068

Filed Apr. 25, 1979, Ser. No. 33,042

Int. Cl.³ B65D *85/57*

U.S. Cl. 312—9 **7 Claims**



1. A phonograph record holder comprising:

a. a circular case divided normally to its axis into two sections each of which has an open end normally confronting the other section, and being closed at its opposite end to form a base, each of said sections being adapted to carry one or more disc-type phonograph records therein normally to its axis,

b. connecting means operable to secure the open ends of said case sections in interengaging relation to close said case, with the records contained in each section confined to their respective sections, said connecting means being adjustable to secure said sections together at varying degrees of axial interengagement, whereby to compensate for variable numbers of records carried in each of the case sections, and

c. loading means carried within the case and operable, as said case sections are moved coaxially into interengagement to close said case, to exert an axial load on the record or stack of records carried in each case section, whereby to secure said records against movement relative to each other, or relative to said case.

4,230,381

TWO PIECE CABINET COVER

John P. Rhoades, San Antonio, Tex., assignor to Stainless Icetainer Company, San Antonio, Tex.

Filed Jul. 20, 1979, Ser. No. 58,970

Int. Cl.³ E05D *15/58*; B65D *43/00*

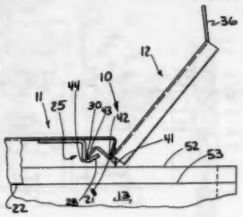
U.S. Cl. 312—295 **19 Claims**

1. A two-piece openable cover for normally closing an upward facing opening in a cabinet box, comprising

(a) a retaining lid having a top panel, side flanges depending from the top panel, a downward extending retaining flange along and depending from one of the edges of the top panel, and a stop edge on the bottom of the retainer flange;

(b) an internal retainer clip mounted to the underside of said top panel in a position adjacent and parallel to but spaced just inwardly from said retainer flange, said clip having a leg extending downward from the top panel, a foot extending from the leg and generally toward the retainer flange, and a toe on the distal end of the foot, said toe being spaced inwardly of the retainer flange; and

(c) a captured lid having a cover panel, a handle adjacent to a first edge of the cover panel, an upright flange extending generally perpendicular to the cover panel from a second and relatively opposite edge thereon, and an arm extending generally perpendicular from the upright flange and away from the cover panel; and in which



(d) said lids are positively interconnectable in either of

(1) a limited pivotal connection in which the captured lid upright flange and arm are captured within and between the retainer lid retainer flange and retainer clip, said upright flange and arm being abuttable against the retainer flange and clip respectively for providing only limited pivotal movement of the captured lid with respect to the retainer lid, so that said captured lid is self-closing when so-pivotally connected, and

(2) a sliding connection in which the captured lid upright flange and arm are captured inwardly of the retainer clip and under the top panel, said lids being relatively slidable with respect to each other with the captured lid going underneath the retainer flange and the clip into a position underneath the retainer lid.

4,230,382

PLASTICS DRAWER FOR FURNITURE

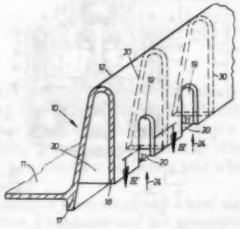
Erich Wenzlick, Durlangen, and Hermann Rothfuss, Waiblingen, both of, Fed. Rep. of Germany, assignors to BBP Kunststoffwerk Marbach Baier & Co., Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 943,272

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742328; Nov. 17, 1977, 2751412; Aug. 4, 1978, 2834152

Int. Cl.² A47B *88/00*; A47F *5/00*

U.S. Cl. 312—330 R **35 Claims**



1. In a drawer, made of plastics material, for furniture, comprising:

(i) a base
(ii) a front wall including an inner wall portion which is smooth and continuous and which is integrally joined to said base
(iii) support means provided at least adjacent to longitudinal ends of said front wall, said support means being spaced forwardly of said inner wall portion, said support means including an opening therein,
(iv) a facing abutting an outer face of said support means, and
(v) locking means projecting from the facing and adapted to extend each through the opening of a respective support means and to abut an inner face of said support means, thereby to secure the facing to the support means,

the improvement which comprises:

(a) that part of said support means which includes said opening is a wall extending in the longitudinal direction of the front wall of the drawer,
(b) said locking means each include a stem portion to extend through said opening, and a head portion to abut the inner face of the support means,
(c) the width of said opening measured in the longitudinal direction of the front wall is greater than the width of the stem portion measured in that direction, and
(d) the length of said opening measured in the height dimension of the front wall is greater than the height of the stem portion,

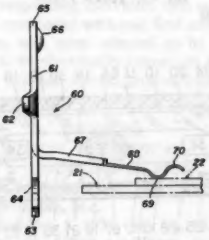
whereby said facing is adjustable on said front wall both in the longitudinal direction and in the height dimension of the front wall.

4,230,383

INTEGRAL CONTACT

Philip J. Burnstein, Skokie; George R. Pariza, Batavia, and Stephen L. Siegel, Hanover Park, all of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Nov. 9, 1978, Ser. No. 959,337
Int. Cl.³ H05K *1/18;* H01R *4/28*
U.S. Cl. 339—17 R **15 Claims**



1. An integral contact for providing electrical connection between a circuit and a circuit element mounted in a housing, said contact comprising a flat elongated body, an ear on said body at one end thereof for electrical and mechanical connection to the circuit, a pair of spaced-apart legs on said body substantially coplanar therewith at the end thereof opposite said ear mountable in the housing, an arm extending laterally from said body at an oblique angle thereto between said ear and said legs, and bifurcated fingers carried by said arm for springingly electrically engaging the circuit element.

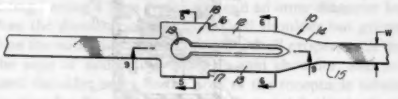
4,230,384

ELECTRICAL CONTACT

John W. Anhalt, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,245
Int. Cl.³ H05K *1/00;* H01R *11/22, 4/10*
U.S. Cl. 339—17 R **8 Claims**

1. A printed circuit board assembly comprising:
a printed circuit board having a through hole internally plated with an electrically conductive material;
a terminal press fit into said hole, said terminal including a binding post or the like, a resilient support and a connecting part therebetween;
said resilient support being located in said hole and consisting of a pair of longitudinal torsion members arranged in wedge-like orientation in transverse cross-section;
said connecting part having one end fixed relative to each of an adjacent pair of ends of said torsion members and another end fixed relative to said binding post, said connecting part being tapered from a larger cross section at said one end to a smaller cross section at said other end to permit said support to be press fit into said hole;



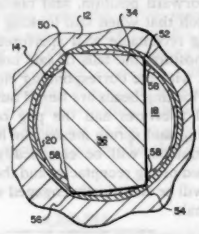
said torsion members having facing surfaces and surfaces not facing, each of said surfaces not facing including an outer longitudinal edge engaging the conductive material on the interior of said hole;
said facing surfaces having inner longitudinal edges engaging with each other at a fulcrum point and inner longitudinal edges spaced from each other; and
said torsion members rotating toward each other around said fulcrum point when said support is press fit into said hole whereby a side wiping action occurs between said outer longitudinal edges and the conductive material on the interior of said hole.

4,230,385

PRINTED CIRCUIT BOARD, ELECTRICAL CONNECTOR AND METHOD OF ASSEMBLY

J. Preston Ammon, and Harry R. Weaver, both of Dallas, Tex., assignors to Elfab Corporation, Dallas, Tex.

Continuation of Ser. No. 805,727, Jun. 13, 1977, abandoned.
This application Feb. 6, 1979, Ser. No. 9,957
Int. Cl.³ H05K *1/08*
U.S. Cl. 339—17 R **31 Claims**



1. In a printed circuit board of the type comprising an insulative mounting substrate having conductive circuitry formed thereon and plated through holes which are usually coated with solder, constructed therein, which plated through holes are adapted for receiving electrically connecting and rigidly mounting press fit contact terminals in tight frictional engagement therein, said contact terminals having a cross sectional size greater than the inside diameter of said plated through hole, the improvement comprising insulative coating masking the exposed surfaces of the conductive circuitry and plating of said plated through holes in a thin film laminar configuration therein replacing the presence of solder upon said circuirty and within said plated through holes and adapted for penetration in the plated through holes by direct press fit insertion of the contact terminals therein for effecting a tight electrical and rigid mechanical interengagement between the conductive

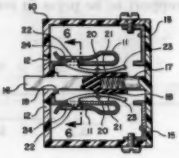
circuitry within the plated through holes and the contact terminal.

4,230,386

SELF LOCKING SAFETY SOCKET

Ivan A. Farnworth, 441 S. State, and Ivan R. Farnworth, 946 S. 500 East, both of Orem, Utah 84057

Filed Jan. 12, 1979, Ser. No. 2,942
Int. Cl.[3] H01R *13/44*
U.S. Cl. 339—42 **10 Claims**



1. A safety socket assembly comprising a non-conductive housing containing;

(a) a pair of parallel conductive prong receptacles adapted to receive the prongs of an electrical plug each of said receptacles containing an aperture in a wall therein adapted to receive locking means,

(b) a pair of corresponding electrical terminals spaced from, but electrically connectable to said prong receptacles,

(c) a rearwardly displacable, non-conductive, non-rotatable peg axially aligned between said prong receptacles said peg extending forwardly from the front of said housing when the peg is in its forward position,

(d) alignment means to keep said peg in axial alignment between said prong receptacles,

(e) spring means interspersed between said peg and the rear of said housing exerting a forward force on said peg,

(f) a pair of flexible, conductive contacts each contact being attached to opposite sides of said peg, and located adjacent a prong receptacle, each contact having a forward locking head and a rear contact tail, said locking head being in alignment with and tensioned to snap into a prong receptacle aperture in a locking relationship when the peg is in its forward position, said contacts being sized and shaped such that when said locking heads are located in said prong receptacle wall apertures with the peg in its forward position the tails of said contacts are not in engagement with the corresponding electrical terminal, but when the locking heads are flexed out of the prong receptacle wall apertures and the peg rearwardly displaced compressing said spring means, the locking heads of said flexible contacts will be electrically engaged with the walls of said prong receptacles and the tails of said flexible contacts will be electrically engaged with the corresponding terminals.

4,230,387

CONTINUOUS CONNECTOR

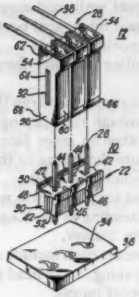
Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,057
Int. Cl.[3] H01R *9/22, 13/48*
U.S. Cl. 339—59 M **6 Claims**

1. An endless connector arrangement comprising

a first continuous length of insulating material, said first length of insulating material having electrical contacts spaced therealong and being provided with severence means intermediate said contacts for selectively severing said first length of insulating material at locations intermediate said contacts;

a second continuous length of insulating material, said second length of insulating material having electrical contacts spaced therealong and being provided with severance means intermediate said contacts for selectively severing said second length of insulating material at locations intermediate said contacts;



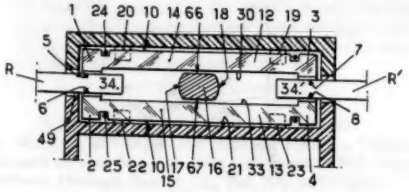
one surface of said first length of insulating material and one surface of said second length of insulating material having interconnection means for removably joining said first and second lengths of insulating material.

4,230,388

CONNECTION HOUSING FOR ALIGNED BUS BARS

Jean-Pierre Thierry, Genlis; Alain Debionne, Pont de Pany, and Daniel Nourry, Dijon, all of France, assignors to La Telemecanique Electrique, France

Filed Jul. 30, 1979, Ser. No. 62,083
Claims priority, application France, Jul. 31, 1978, 78 22563
Int. Cl.[3] H01R *11/09*
U.S. Cl. 339—74 R **7 Claims**



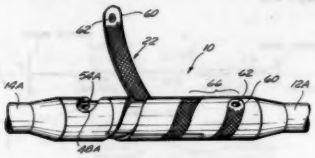
1. In a connecting means, for the electrical coupling of ends of first bus bars of rectangular section, placed parallel at the interior of a protection sheath, to other similar bus bar ends placed opposite to said first bus bars, said means comprising conductive clips which are each applied resiliently on the ends of two bars situated in a same plane, and housings in insulating members disposed between the bus bar ends and parallel to the bars serving for the support and insulation of the said clips, the improvement that, with each pair of ends of coplanar bars there is associated at least one clip constituted by two rigid contact bridges perpendicular to said plane, the extremities of which bridges, placed opposite to each other and carrying contact buttons, are submitted locally to the action of a resilient element which urges them together, respective arms of said contact bridges being disposed at each side of a rotary locking element which has cam surfaces cooperating when in a predetermined position with said arms to separate them, said rotary locking element being pivoted in two bearings on insulating elements at each side of a housing for said clips.

4,230,389

FLEXIBLE ELECTRICAL CONNECTOR ASSEMBLY

Edward J. Kotski, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,088
Int. Cl.[3] H01R 13/54, 23/06
U.S. Cl. 339—75 M 6 Claims



1. In an electrical connector assembly of a type for separably connecting sections of a multiple conductor power cable having first and second live conductors to produce a flexible power cable of required length, at least one live conductor of a first one of said sections being electrically connected to a corresponding live conductor of a second one of said sections with matable first and second electrical connector elements electrically connected to said first and second live conductors, respectively, comprising:

(a) first and second separable matable sections, said first and second sections being disposed about said first and second electrical connector elements, respectively, so as to allow an electrical connection therebetween when said first and second sections are joined together, each of said first and second matable sections having an exterior surface including a portion of a recess, said recess portions together providing, upon engagement of said matable sections with each other, said exterior surface of said connector assembly with a recess which is spirally shaped relative to the longitudinal axis of said matable sections; and

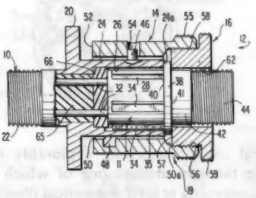
(b) an elongate flexible braided strap for electrically connecting corresponding individual first and second ground conductors associated with said first and second sections, respectively, said strap adapted to be disposed in said recess and to be electrically connected between said corresponding first and second ground conductors .

4,230,390

DOUBLE ACTION, ELECTRICAL CONNECTOR COUPLING DEVICE

Royzell F. Wells, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Feb. 8, 1979, Ser. No. 10,345
Int. Cl.[3] H01R 4/54; F16L 23/00
U.S. Cl. 339—90 R 10 Claims



1. In a connector comprising a cylindrical female receptacle member including a tubular portion, a cylindrical male plug member including a plug shell received within said receptacle member tubular portion, and wherein one of said members bears at least one bayonet pin which projects radially from said one member and is received within a bayonet cam groove on the opposed periphery of the other member, and wherein said plug shell bears a radial shoulder intermediate of its ends, said radial shoulder having an outer diameter in excess of the inner diameter of the receptacle member tubular portion so as to abut the nose of the tubular portion, said plug member including a coupling ring concentrically carried by said male plug member and having a portion concentrically surrounding said receptacle and forming the bayonet connection with said receptacle member, and said shoulder having an outer diameter less than the inner diameter of said coupling ring, the improvement comprising:

the end of said coupling ring remote from said receptacle member being fine threaded on its inner periphery, and

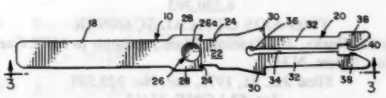
a cylindrical fitting fine threaded on its outer periphery and being threaded to the inner periphery of said ring, said fitting having a nose at one end and an inner diameter less than the diameter of said plug shell shoulder but greater than the outer diameter of said plug shell proper, such that the nose of said fitting bears on said shoulder, and said shell shoulder bears on the nose of the receptacle tubular portion for fine threaded metal-to-metal locking of said plug member to said receptacle member to effect constant electrical grounding of said plug shell to said female receptacle member.

4,230,391

ELECTRICAL CONTACT

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 1, 1978, Ser. No. 938,995
Int. Cl.[3] H01R 9/08
U.S. Cl. 339—97 R 26 Claims



24. In an electrical contact having an open-ended slotted terminal portion, said slotted terminal portion being formed by a pair of spaced conductor engaging arms having inside edges which define a generally uniformly tapered, inwardly diverging elongated slot means beginning at the open end of said slotted terminal element and extending inwardly therefrom for receiving a conductor, said conductor engaging arms having a generally uniform cross-section extending substantially the entire length of said slot portion whereby said slot means cooperates with said arms for providing substantially uniform normal forces on the conductor as the conductor is moved inwardly from said open end along the slot for termination purposes.

4,230,392

ELECTRICAL SOCKET CONNECTOR

Robert D. Leonard, Jr., Poland, and Charles R. Nestor, Niles, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1979, Ser. No. 22,821
Int. Cl.[2] H01R 4/64
U.S. Cl. 339—117 R 5 Claims

1. A socket connector for post terminals, comprising:

a connector body comprising a housing and a cover secured together forming a longitudinal series of chambers and a socket,

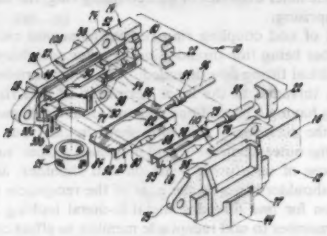
said longitudinal series of chambers including an elongated chamber at one longitudinal end of the connector body which is closed at the one end and which has an opening in its bottom wall aligned with the socket, and a seal chamber at the opposite longitudinal end of the connector body having an exit opening,

a terminal and attached wire conductor disposed in the

longitudinal chambers with the wire conductor extending through the seal chamber and leading out of the connector body through said exit opening,

said terminal having a channel shaped contact portion which is disposed in the elongated chamber and which includes a pair of laterally spaced side rails,

said terminal and attached wire conductor being laterally



insertable into cavity portions of the housing forming part of the longitudinal series of chambers for assembly into the housing prior to securement of the cover,

elastomeric seal means disposed in the seal chamber sealing around a portion of the wire conductor extending therethrough, and

a vented socket seal disposed in the socket of the connector body.

4,230,393

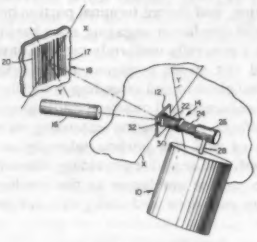
TWO-AXIS OPTICAL SCANNER

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Filed Jul. 31, 1978, Ser. No. 929,520

Int. Cl.³ G02B 27/17

U.S. Cl. 350—6.5 **6 Claims**



1. An optical scanner comprising:

A. a transducer providing a mechanical reciprocating output,

B. an optical element,

C. a link having a first end connected to said transducer and a second end connected to said optical element to impart motion to said optical element in response to the output of said transducer,

i. said link being compliant in a finite number, not less than two, of intersecting planes,

ii. said link and the masses associated therewith, including the mass of said optical element, having resonances associated with the compliances thereof,

iii. said link being oriented to receive at said first end vibrating components from said transducer in each of said planes, thereby to provide simultaneous flexure of said link in each of said planes and simultaneous movement of said optical element in said planes.

4,230,394

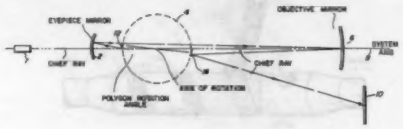
MIRROR FACET TRACKER USING SPHERICAL MIRRORS

Harry P. Brueggemann, San Marino, and David A. Grafton, Santa Monica, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1979, Ser. No. 26,275

Int. Cl.³ G02B 27/17

U.S. Cl. 350—6.8 **4 Claims**



1. An all mirror system for tracking facets of a rotating, multi-faceted polygon, comprising a light source (7) for projecting a light beam along a system axis (8), a rotating polygon (4) having a plurality of facets (12, 14, 16) and having its axis of rotation intersecting the system axis (8), and a photosensitive surface (10) disposed off of the system axis (8) characterized in

a first spherical mirror (2) disposed on one side of rotating polygon (4) and a second spherical mirror (6) disposed on a second side of rotating polygon (4), the centers of curvature of mirrors (2) and (6) being along a system axis (8), the distance between the second spherical mirror (6) and one of the facets (14) being chosen so that upon rotation of the one facet (14) from the system axis (8) the light beam moves from the system axis (8) by an amount equal to the amount of rotation of the one facet (14) from the system axis (8) such that the light beam follows the facet (14) and the light beam is swept across the photosensitive surface (10).

4,230,395

OPTICAL CABLES WITH LOOSELY HOUSED OPTICAL GUIDES

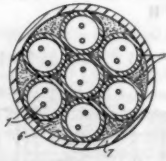
Noel S. Dean, Greater Manchester; Joseph E. G. Chapman, Prescot, and Eric L. Williams, Newton-le-Willows, all of England, assignors to BICC Limited, London, England

Filed Feb. 3, 1976, Ser. No. 654,868

Claims priority, application United Kingdom, Feb. 5, 1975, 4949/75

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **22 Claims**

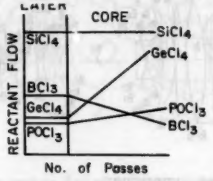


1. An optical cable comprising a plurality of separately formed flexible tubes in at least one of which at least one optical guide comprising at least one optical fibre, which guide as a unit has an overall diameter that is substantially less than the internal diameter of the tube, is so housed that the optical guide as a unit is loose with respect to the tube throughout the whole length of the cable and generally spaced from the tube so that limited relative movement between the optical guide as a unit and the tube can take place at any transverse cross-section of the cable when the cable is flexed and, surrounding the plurality of tubes, an outer protective sheath.

4,230,396
HIGH BANDWIDTH OPTICAL WAVEGUIDES AND METHOD OF FABRICATION

Robert Olshansky, Addison, and Arnab Sarkar, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,416
Int. Cl.³ G02B *5/14*; C03B *37/075*
U.S. Cl. 350—96.31 **11 Claims**



8. A high bandwidth gradient index optical filament comprising

an outer cladding layer,

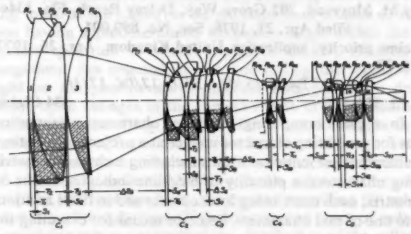
a barrier layer having an index of refraction equal to or less than said cladding layer disposed on the inside wall surface of said cladding layer, said barrier layer consisting essentially of a base glass, B_2O_3 and at least one additional dopant, the quantity of each of said base glass, B_2O_3, and dopant being substantially uniform throughout the thickness of said barrier layer, and

a core of high purity glass having a gradient index of refraction disposed within said barrier layer and adhered thereto to form an interface therebetween, said core having an index of refraction approximately equal to said barrier layer at said interface there being no step increase in the index of refraction of the core at said interface, said core consisting essentially of a base glass, B_2O_3, and each of said dopants, the quantity of B_2O_3 decreasing within said core from said interface towards the central axis of said optical filament while the quantity of said one or more dopants gradually vary from said interface towards said central axis in a predetermined manner so as to result in a desired substantially continuously varying gradient index of refraction across the cross section of said core.

4,230,397
LARGE APERTURE EXTENDED RANGE ZOOM LENS

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 21, 1978, Ser. No. 944,341
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.² G02B *15/18*
U.S. Cl. 350—184 **1 Claim**



1. An optical system for a variable focal length lens of large effective aperture, which is focusable over an extended range, having substantially the following specification:

SYSTEM EFL		HALF ANGLE OF FIELD
at W/A =	7.61mm (.2997 in.)	25.35°
at T/P =	56.98mm (2.2433 in.)	3.31°
at MID =	25.67mm (1.0105 in.)	7.58°

LENS	RADII (mm.)	THICKNESS (mm.)
1	$R_1 = 240.7589$	
		$T_1 = 1.6510$
	$R_2 = -51.1988$	
2	$R_3 = 51.1988$	
		$T_2 = 12.7000$
	$R_4 = 153.6954$	
3	$R_5 = 43.6880$	
		$T_3 = 7.7978$
	$R_6 = -139.7000$	
4	$R_7 = 71.7550$	
		$T_4 = .8128$
	$R_8 = -16.5100$	
5	$R_9 = -24.0030$	
		$T_5 = .8382$
	$R_{10} = -19.1008$	
6	$R_{11} = 19.1008$	
		$T_6 = 3.5052$
	$R_{12} = -59.9948$	
7	$R_{13} = 58.9280$	
		$T_7 = .8890$
	$R_{14} = -21.7424$	
8	$R_{15} = 21.7424$	
		$T_8 = 5.6388$
	$R_{16} = 30.2260$	
9	$R_{17} = 22.7203$	
		$T_9 = 3.1496$
	$R_{18} = -93.1672$	
10	$R_{19} = -45.5168$	
		$T_{10} = .7112$
	$R_{20} = -12.8016$	
11	$R_{21} = 14.6431$	
		$T_{11} = 2.0574$
	$R_{22} = -27.0256$	
12	$R_{23} = 18.0848$	
		$T_{12} = 3.6576$
	$R_{24} = 32.8168$	
13	$R_{25} = -21.9202$	
		$T_{13} = .7112$
	$R_{26} = -16.8656$	
14	$R_{27} = 61.2140$	
		$T_{14} = 4.3180$
	$R_{28} = -14.5288$	
15	$R_{29} = 14.5288$	
		$T_{15} = 3.2512$
	$R_{30} = 26.9494$	
16	$R_{31} = 14.7320$	
		$T_{16} = 2.5654$
	$R_{32} = -463.9259$	

LENS	RADII (mm.)	SPACINGS (mm)	N_D	V
1	$R_1 = 240.7589$			
			1.755	27.6
	$R_2 = -51.1988$			
		$S_1 = 0$		
2	$R_3 = 51.1988$			
			1.620	60.4
	$R_4 = 153.6954$			
		$S_2 = .1016$		

-continued

3	$R_5 = 43.6880$			
			1.651	55.9
	$R_6 = -139.7000$			
		$S_3 = 4.2875$ at W/A 29.5554 at T/P 22.3952 at MID		
4	$R_7 = 71.7550$			
			1.639	55.4
	$R_8 = -16.5100$			
		$S_4 = 6.6294$		
5	$R_9 = -24.0030$			
			1.620	60.4
	$R_{10} = -19.1008$			
		$S_5 = 0$		
6	$R_{11} = 19.1008$			
			1.785	25.8
	$R_{12} = -59.9948$			
		$S_6 = 38.4048$ at W/A 2.5857 at T/P 14.2570 at MID		
7	$R_{13} = 58.9280$			
			1.805	25.4
	$R_{14} = -21.7424$			
		$S_7 = 0$		
8	$R_{15} = 21.7424$			
			1.641	60.1
	$R_{16} = 30.2260$			
		$S_8 = .1016$		
9	$R_{17} = 22.7203$			
			1.691	54.9
	$R_{18} = -93.1672$			
		$S_9 = 1.6002$ at W/A 12.1514 at T/P 7.6403 at MID		
10	$R_{19} = -45.5168$			
			1.691	54.9
	$R_{20} = -12.8016$			
		$S_{10} = 2.2352$		
11	$R_{21} = 14.6431$			
			1.805	25.4
	$R_{22} = -27.0256$			
		$S_{11} = 11.0490$ ——STOP—— $S_{12} = 3.5560$		
12	$R_{23} = 18.0848$			
			1.744	44.8
	$R_{24} = 32.8168$			
		$S_{13} = 1.6002$		
13	$R_{25} = -21.9202$			
			1.805	25.4
	$R_{26} = -16.8656$			
		$S_{14} = .7336$		
14	$R_{27} = 61.2140$			
			1.805	25.4
	$R_{28} = -14.5288$			
		$S_{15} = 0$		
15	$R_{29} = 14.5288$			
			1.744	44.8
	$R_{30} = 26.9494$			
		$S_{16} = .1270$		
16	$R_{31} = 14.7320$			
			1.734	51.7
	$R_{32} = -463.9259$			
		$S_{17} = 11.4529$		

wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii R_1 to R_{32}; the third column lists the thicknesses T_1–T_{16} of the respective elements; the fourth column lists the axial spacings S_1 to S_{17} between the respective elements, and stop, and the image plane; and the fifth and sixth columns respectively list the index of refraction for the Sodium D line N_D and the dispersive index V of the optical materials of the respective elements.

4,230,398

ZOOM LENS SYSTEM

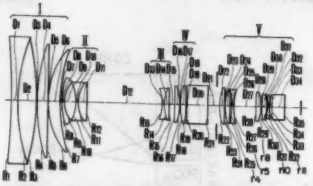
Sadahiko Tsuji, Yokohama, and Yasuhisa Sato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,860

Claims priority, application Japan, Jul. 26, 1977, 52-89665

Int. Cl.³ G02B *15/18*

U.S. Cl. 350—184 **2 Claims**



1. A zoom lens comprising:

a focusing lens having a positive refractive power, movable for focusing purposes, and stationary during zooming;

a variator having a negative refractive power, movable for variation, and arranged on the image side of said focusing lens;

a compensator having a negative refractive power, movable simultaneously with said variator, and arranged on the image side of said variator;

a converter for substantially collimating a beam of rays emanating from said compensator; and

a basic lens for image forming purposes having a front sub-group and a rear sub-group each of which consists of two positive lenses and a negative lens in this order, satisfying the following relationships:

$$3Fr < Ff < 7Fr$$

$$\frac{0.5}{Fr} < \frac{1}{r4} - \frac{1}{r5} < \frac{1.2}{Fr}$$

$0.65Fr < |\ r8\ | < 0.85Fr$, said $r8$ having a negative value;

$$\frac{0.15}{Fr} < \frac{1}{r10} - \frac{1}{r11} < \frac{0.6}{Fr}$$

where Fr is the focal length of the basic lens; Ff is the focal length of said front sub-group; r4 is the radius of curvature of the rear surface of the second positive lens in said front sub-group; r5 is the radius of curvature of the front surface of the negative lens in said front sub-group; r8 is the radius of curvature of the rear surface of the first positive lens in said rear sub-group; r10 is the radius of curvature of the rear surface of the second positive lens in said rear sub-group; and r11 is the radius of curvature of the front surface of the negative lens in said rear sub-group.

4,230,399

PHOTOCOMPOSING MACHINE AND METHOD

Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla. 33444

Filed Apr. 21, 1978, Ser. No. 899,001

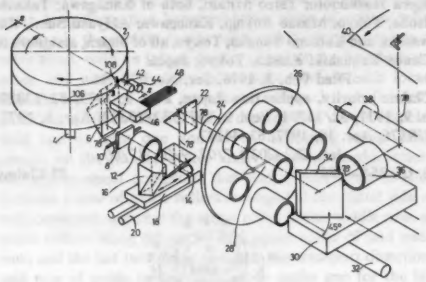
Claims priority, application United Kingdom, Apr. 26, 1977, 17431/77

Int. Cl.³ B41B *15/08, 15/16, 17/04, 17/18*

U.S. Cl. 354—10 **34 Claims**

1. In a photocomposing machine, character presentation means for presenting character images at a projection location, said character presentation means including a character matrix bearing characters, a plurality of base-line indicator marks on said matrix, each mark being located near and in fixed relationship to one of said characters, detector means for detecting the location of each of said marks relative to a fixed reference location and producing a corresponding error signal, and correction means for correcting the position of each of said char-

acter images in accordance with its corresponding error signal to align each of said images on a common base-line.



16. A character matrix for photocomposition, said matrix comprising a support, a plurality of characters of a given type face on said support, and coded indicia on said support representing the weight of said type face.

4,230,400

PHOTOGRAPHIC CAMERA WITH EXPOSURE-CONTROL AND FOCUSSING MEANS

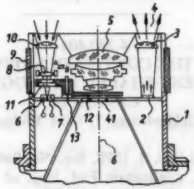
Richard Wick; Otto Stemme, both of Munich; Peter Lermann, Feldkirchen; Karl Wagner, Munich; Kurt Borowski, Aschheim; Istvan Cocron, Munich, and Günter Fauth, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,736

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752929

Int. Cl.³ G03B *7/081, 7/099, 13/18*

U.S. Cl. 354—25 **17 Claims**



1. In a photographic camera, in combination, electronic exposure-control means having a light-dependent-signal input and operative for controlling exposure in dependence upon a light-dependent signal applied thereto; state-of-focus evaluating means comprising a photosensitive detector arrangement producing light-dependent-signals, and including at least one pair of photosensitive elements, and including an emitter emitting towards the subject to be photographed a beam of radiation having a predetermined frequency range within the frequency spectrum to which the photosensitive detector arrangement can respond, means controlling the incidence of light on the photosensitive detector arrangement in dependence upon changes in the camera's state of focus, including means for controlling, in dependence upon changes in the camera's state of focus, the relative locations of the photosensitive detector arrangement, on the one hand, and of said beam of radiation as reflected back from the subject to be photographed, on the other hand, the means controlling the relative locations of the photosensitive detector and beam of radiation comprising means controlling the distribution of the reflected-back beam of radiation as between the two elements of the photosensitive-element pair, means receiving the light-dependent signals produced by the detector arrangement and deriving therefrom a stat-of-focus signal indicating the camera's state of focus, including subtracting means receiving and subtracting from each other the light-dependent signals produced by the two elements of the photosensitive-element pair, and supressing means operative for suppressing the effect of radiation not originating from said emitter upon the light-dependent signals produced by the photosensitive elements, including an optical filter located in front of the photosensitive elements and operative for transmitting thereto substantially only radiation of frequency within said predetermined frequency range, and means moving the optical filter out of the light path of the photosensitive elements during exposures controlled by the exposure-control means; and connecting means connecting the photosensitive detector arrangement of the state-of-focus evaluating means to the light-dependent-signal input of the exposure-control means for transmitting light-dependent signals to the latter from the former, so that the photosensitive detector arrangement be shared by both the exposure-control means and the state-of-focus evaluating means.

4,230,401

CAMERA FOCUS DETECTING DEVICE

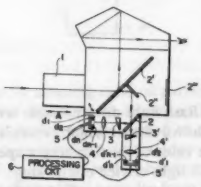
Seijiro Tokutomi, Tokyo; Masao Jyojiki, Tsurugashima, and Kazuo Nakamura, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,122

Claims priority, application Japan, Dec. 22, 1977, 52-154730

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—25 **21 Claims**



1. A camera focus detecting system comprising; optical means for obtaining two images from an object; an optical member for displacing at least one of said two images relative to each other; means including photoelectric conversion elements forming two groups for converting variations in light quantity of portions of said object into electrical output signals; a photographing lens for projecting the image of said object onto said photoelectric conversion element means; circuit means for calculating outputs

$$V_{out-1} = \sum_{m=1}^{n-1} | i_m - i_{m+1} | \text{ and } V_{out-2} = \sum_{m=1}^{n-1} | i_m' - i_{m+1} |$$

from the outputs of the photoelectric conversion elements forming said photoelectric conversion element means; calculation circuit means having a first calculation function for calculating $V_{out-3}=V_{out-1}+V_{out-2}$ and a second calculation function for calculating $V_{out-4}=V_{out-1}-V_{out-2}$, so that when V_{out-3} becomes higher than a predetermined value, different outputs are produced under conditions that $V_{out-4}>\epsilon_1$, $\epsilon_1 \geqq V_{out-4} \geqq \epsilon_2$, and $\epsilon_2 > V_{out-4}$; and a display means for effectuating different displays according to said different outputs, wherein: n is the number of said photoelectric conversion elements forming each of said two photoelectric conversion element groups, m is a discrete number of a photoelectric conversion element, i is the output of a photoelectric conversion element in one of said two photoelectric conversion element groups, i' is the output of a photoelectric conversion element the second photoelectric conversion group and ϵ_1 and ϵ_2 are predetermined constants.

4,230,402

FLASH EXPOSURE CONTROL SYSTEM

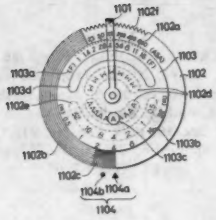
Takashi Uchiyama, Yokohama; Zenzo Nakamura, Urawa, and Shohei Ohtaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 855,339, Nov. 28, 1977, abandoned. This application Mar. 3, 1978, Ser. No. 883,298

Claims priority, application Japan, Nov. 30, 1976, 51-143916; Mar. 3, 1977, 52-23131

Int. Cl.[3] G03B *15/05;* G06C *3/00*

U.S. Cl. 354—33 6 Claims



1. A computer flash light device usable with a camera having an aperture control circuit which controls the aperture size on the basis of the value of the diaphragm aperture signal from the computer flash light device comprising:

(a) flash means for producing a flash light;

(b) exposure information setting means including:

(1) a non-movable plate provided with aperture value marks;

(2) a first movable member provided so as to be movable relative to the non-movable plate, said member being set at a desired aperture value mark on the non-movable plate; and

(3) a second movable member provided so as to be movable relative to the non-movable plate, said member being provided with film sensitivity marks so as to set the film sensitivity by setting the determined film sensitivity mark at the aperture value mark selected by the first movable member;

(c) a flash light amount control circuit for controlling the amount of the flash light emitted by the flash means;

(d) adjusting means coupled to said flash light amount control circuit, said adjusting means for adjusting said amount of the flash light controlled by the light amount control circuit as a function of the displacement position relative to the non-movable plate of the second movable member; and

(e) a diaphragm aperture value signal forming circuit having an aperture value adjusting means which is coupled with the first movable member so as to adjust the aperture value as a function of the displacement position relative to the non-movable plate of the first movable member, said diaphragm aperture value signal forming circuit producing a diaphragm aperture signal having a value corresponding to the aperture value adjusted with the adjusting means.

4,230,403

MOUNTING FOR INTERCHANGEABLE CAMERA LENS ASSEMBLY WITH DIAPHRAGM MEANS

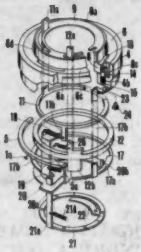
Shigeru Hashimoto; Taizo Mitani, both of Kanagawa; Takashi Isobe, Tokyo; Masao Aoyagi, Kanagawa; Akiyasu Sumi, Kawasaki, and Katsumi Tanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 875,096

Claims priority, application Japan, Feb. 8, 1977, 52/12827; Feb. 9, 1977, 52/13391; Feb. 9, 1977, 52/13392; Apr. 6, 1977, 52/39176; Apr. 18, 1977, 52/44247

Int. Cl.[3] G03B *7/02, 9/02, 17/00*

U.S. Cl. 354—286 37 Claims



1. An assembly wherein said compensating means comprises a compensation member pivotally mounted on the lens barrel body, a cam member fixedly mounted on said adapter member and having a camming surface for engagement with the elongated portion of the transmission means, whereby when the lens barrel is detached from the camera body, the compensation member is moved in engagement with the camming surface of the cam member and at the same time pushes the transmission means at the elongated portion thereof to return the transmission means to the initial position.

4,230,404

DEVICE FOR THE CONTINUOUS DEVELOPING OF BAND- AND SHEET-SHAPED PHOTOGRAPHIC LAYER CARRIERS

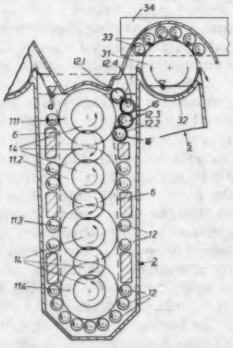
Heinrich Huss, Liebigstrasse 1, 6054 Rodgau 6, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,858

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740650; May 24, 1978, 2822677

Int. Cl.[3] G03D *3/13*

U.S. Cl. 354—321 4 Claims



1. Arrangement for the pass-through development of band- or sheet-shaped photographic layer carriers, having devices

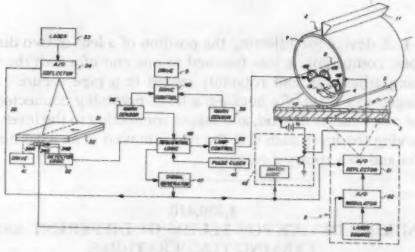
for transporting the layer carrier through several bath containers arranged successively in pass-through direction and between each two of which a receptacle of fluid is located, the layer carrier being advanced in the pass-through direction under loop formation between three rows of rollers whose diameter in the middle row is substantially greater than in the outer rows, with an infeed device ahead of the first bath container and with a plurality of transfer devices each located between each two bath containers and each transfer device including a driven transfer roller dipping into the receptacle of fluid and at least one non-driven deflecting roller resting loosely on the transfer roller under its own weight, wherein the improvement comprises that one of said rows of rollers includes a row of guide rollers arranged at the outlet side of a bath container adjacent the upper roller of the middle row, said guide rollers being driven by said upper roller of said middle row, and the last two guide rollers in the transport direction of said row of guide rollers forming an outlet gap for the layer carrier, the deflecting rollers of the respective transfer device being arranged in an arc and their diameters being substantially smaller than the diameter of the transfer roller; a frame having end walls in which said deflecting rollers are journalled for radial shifting towards the axis of the transfer roller; and means mounting said frame vertically shiftable on the arrangement.

4,230,405

ELECTRONIC IMAGING APPARATUS USING MULTICOLOR ELECTROPHOTOSENSITIVE PARTICLES

Clark N. Kurtz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1979, Ser. No. 53,151
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—4 **20 Claims**



1. Apparatus for color imaging with a layer of developer which contains electrophotosensitive particles of different color types, respectively sensitive to light of different colors, said apparatus comprising:

(a) means for exposing successive strips of such a layer respectively to successive series of time-separated light pulses, the pulses in such series being respectively of said different light colors;

(b) addressable electrode means adjacent such layer for providing discrete electrical fields across individual pixels of exposed strips in response to an activating electromagnetic radiation; and

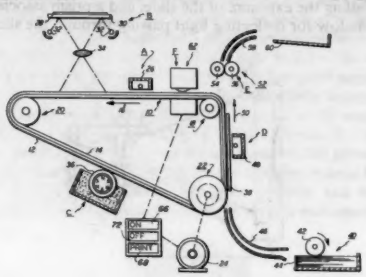
(c) means for selectively addressing pixels of said electrode means with activating electromagnetic radiation in a proper timed relation with said light pulses and in magnitude according to the color content of the image to be replicated so as to effect particle migration within said layer corresponding to said replicated image.

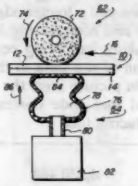
4,230,406

CLEANING SYSTEM FOR AN ELECTROSTATIC COPIER

Stanley D. Klett, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1979, Ser. No. 23,936
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **14 Claims**





1. An apparatus for cleaning residual particles from a photoconductive member arranged to advance along a pre-determined path after a particle image formed on the photoconductive member has been transferred to a copy sheet, including:

means, normally spaced from the photoconductive member, for removing the residual particles from the photoconductive member, said removing means being inoperative when spaced from the photoconductive member and being operative when in contact therewith; and

pneumatic means, operatively associated with the photoconductive member, for deflecting the photoconductive member from a position spaced from said removing means to a position in contact therewith in response to the photoconductive member moving along the predetermined path, said pneumatic means returning the photoconductive member from the position in contact with said removing means to a position spaced from said removing means in response to the photoconductive member being stationary.

4,230,407

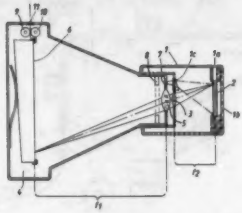
APPARATUS FOR MAKING POSITIVE PICTURES FROM SLIDES

Ursula Möller, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 32,903
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818617
Int. Cl.³ G03B *27/32, 27/52*
U.S. Cl. 355—27 **1 Claim**

1. An apparatus for making positive pictures from slides, in which a camera has a picture-taking lens at infinity setting and in which a slide-copying attachment is connectable to said camera and including means for holding a slide to be reproduced, and a reproducing lens spaced from the slide by a distance and located parallel and proximal to said picture-tak-

ing lens when said attachment is connected to said camera for reproducing a picture of said slide in said camera, wherein the improvement comprises: a self-developing camera having a self-developing film sheet and being connectable to said slide-copying attachment; a light sensing control next to said picture-taking lens which control receives light through a window arranged in said attachment and actuates a shutter for controlling the exposure of the slide; and a prism associated to the window for deflecting light passing through the slide into



an inlet of said light-sensing control, the slide and the picture area of the film sheet each being rectangular and having a shorter edge dimension and a longer edge dimension, the ratio of the focal length of said reproducing lens to the focal length of the said picture-taking lens being equal to the ratio to the longer edge dimension of the slide to the longer edge dimension of the instant-film picture area, the distance between said reproducing lens and said slide corresponding to the focal length of said reproducing lens.

4,230,408

SYSTEM FOR OVERALL COLOR CORRECTION OF COLOR PICTURE INFORMATION CONTAINED IN A PROJECTING MULTI-COLOR LIGHT BEAM

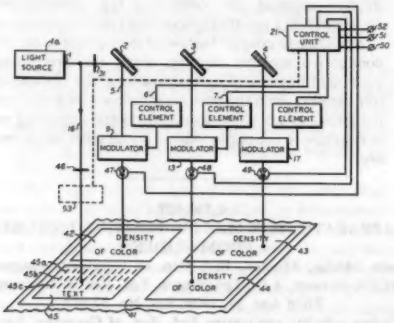
Jurg Nigg, Beckenhofstrasse 30, 8006 Zurich, Switzerland

Continuation-in-part of Ser. No. 704,728, Jul. 12, 1976, Pat. No. 4,087,176, which is a continuation-in-part of Ser. No. 424,040, Dec. 12, 1973, abandoned. This application Feb. 10, 1978, Ser. No. 876,783

Claims priority, application Switzerland, Dec. 4, 1972, 18254/72

Int. Cl.[3] **G03B** *27/72, 27/76*

U.S. Cl. 355—35 **21 Claims**



1. A photographic film for storage of an image and of additional information, comprising a film negative having at least two separated, non-overlapping areas, one of said areas containing said additional information and the other of said areas containing the information constituting said image; said one of said areas containing said additional information containing first and second spaced text patterns; said first and second text patterns containing related intelligence which is pertinent to said image; said first and second text patterns being capable of separate display independently of one another to describe a related characteristic of said image.

16. The method of storing a two-dimensional color image and additional information, comprising the steps of:

separating said image into a plurality of two-dimensional, single-color components;

applying each of said components to a respective separate, non-overlapping two-dimensional mono-color photosensitive area of a photographic film to store the two-dimensional intensity values of each of said components as a respective mono-color image;

producing text information constituting said additional information and comprising first and second text patterns containing related intelligence which is pertinent to said image; and

applying said additional information to an additional separate, non-overlapping area of said film.

4,230,409

DEVICE FOR ADJUSTING THE POSITION OF A LENS IN TWO DIRECTIONS

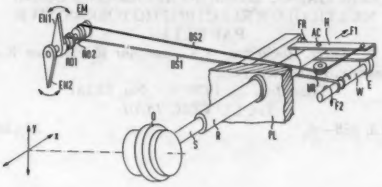
Siegfried Zoeke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,581

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834334

Int. Cl.[3] **G03B** *27/52, 23/00*

U.S. Cl. 355—55 **11 Claims**



1. A device for adjusting the position of a lens in two directions, comprising: a lens fastened to one end of a rod; the rod being adjustably and rotatably seated in a pipe securely arranged to a plate of a housing; a lever pivotably connected at the other end of the rod; and means connecting to the lever for moving the lever such that the rod is moved in an axial direction and in a rotary direction.

4,230,410

MIXING DEVICE FOR FLUIDS OF DIFFERENT AND VARYING TEMPERATURES

Johann Kastl, Troisdorf, and Heinrich Schütz, Lohmar, both of Fed. Rep. of Germany, assignors to INTERATOM, International Atomreaktorbau GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Feb. 8, 1979, Ser. No. 10,705

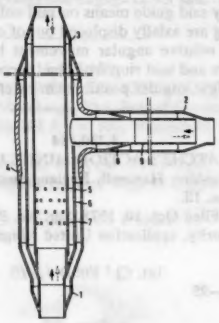
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805576

Int. Cl.[2] **B01F** *5/00*

U.S. Cl. 366—177 **6 Claims**

1. Mixing device for fluids of high, different and/or varying temperatures comprising a housing and a cylindrical, straight mixing tube open at both ends thereof and formed intermediate the ends thereof with numerous radial openings, the mixing tube being secured at one end thereof tightly to the housing and being mounted at the other end thereof so as to be displaceable longitudinally with respect to the housing, a shock tube disposed between the mixing tube and the housing and being, at least at one end thereof, displaceable longitudinally with respect to the housing and the mixing tube, the mixing tube having an outflow end and being secured at least at said out-

flow end thereof tightly to the housing, said shock tube and the mixing tube defining an annular space therebetween, an inner pipe stub terminating in said annular space, said inner pipe stub being concentrically surrounded by a housing union tightly



connected to the housing, said shock tube being formed with a radial opening through which said inner pipe stub extends with a gap between said radial opening in said shock tube and said inner pipe stub.

4,230,411

MATRIX PRINTER

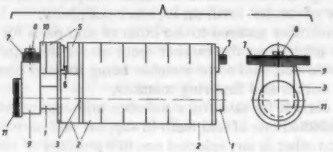
Helmut Gröttrup, Wertherstrasse 14, D-8000 Munich 40, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,705

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725352

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—121 **18 Claims**



1. In a matrix printer in which a plurality of printing punches in the form of sheet strips are arranged parallel to each other and are driveable in different combinations according to the characteristics to be printed, by means of drive systems arranged in series and being associated each with a printing punch, each drive system containing an armature mechanically coupled to the printing punch, as well as a magnetic circuit providing for an air gap and a control coil, and a reset spring being associated with each printing punch for pulling the armature away from the air gap range into an inoperative position, the improvement which comprises said reset spring being loop-shaped and formed as an integral part of an associated printing punch at the stationary end thereof, and lying in the same plane as that of the associated printing punch.

4,230,412

MATRIX PRINT HEAD ASSEMBLY

Donald G. Hebert, San Ramon, Calif., assignor to Helmut Falk, Palo Alto, Calif.

Filed Mar. 17, 1978, Ser. No. 887,927

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **19 Claims**

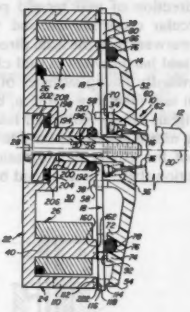
1. A matrix print head assembly comprising:

a number of wire members spaced about a central longitudinal axis and being longitudinally movable between a non-print position and a print position;

guide means for movably supporting said wire members;

a number of rigid armature members equal to the number of wire members movable between a non-print position and a print position and extending radially outwardly of and being circumferentially spaced about the central longitudinal axis with radially inner drive head portions engageable with said wire members during movement from the non-print position to the print position to drive the wire members from the non-print position to the print position;

a number of electromagnet means, having radially innermost and radially outermost pole portions, equal to the number of armature members, mounted in juxtaposition to a radially outer portion of said armature members for pivotally supporting said armature members during movement from the non-print position to the print position and being selectively energizable for causing pivotal movement of



said armature members toward said electromagnet means and opposite pivotal movement of the radially inner portion of said armature members away from said electromagnet means during movement from the non-print position to the print position by magnetic force applied to the radially outer portion;

said armature members being positioned between said electromagnet means and said wire members such that said drive head portions are movable away from said electromagnetic means toward said wire members during movement from the non-print position to the print position;

pivotal support means on the radially innermost pole portions for pivotally supporting an intermediate portion of said armature members during movement of said armature members from the non-print position to the print position; and

resilient axially adjustable abutment means engageable with radially innermost portions of each armature member.

4,230,413

MECHANICAL PENCIL HAVING COLLET GUIDE

Jürgen Gärtner, Nüremberg, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nüremberg, Fed. Rep. of Germany

Filed Oct. 18, 1977, Ser. No. 843,274

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649871

Int. Cl.³ B43K *21/16, 21/22*

U.S. Cl. 401—65 **4 Claims**

1. A mechanical pencil comprising:

(a) a tubular barrel having an axis, a front end and rear end spaced apart in the axial direction;

(b) a front piece removably secured in the front end of said barrel and forming a stop surface therein extending transversely of the axial direction of said barrel;

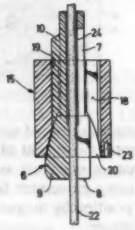
(c) collet means located in said barrel and extending in the axial direction thereof;

(1) said collet means including an axially elongated tubular storage receptacle extending in the axial direction of said tubular barrel, a plurality of axially elongated collet members formed integrally with and extending in the axial direction of said receptacle from the end thereof closer to the front end of said tubular barrel toward the front end thereof, each said collet member having a first, axially extending terminal portion with said first portions fixedly fastened together and to said receptacle and a second axially extending terminal portion movable transversely of the axis of said barrel toward and away from a clamping position contiguously adjacent the second portion of each other said collet member,

(2) said second portions each having an axially extending inwardly facing surface directed toward the axis of said barrel and an oppositely directed axially extending outwardly facing surface with the outwardly facing surfaces having a generally circular cross-section with an outwardly extending projection extending in the axial direction of said second portions and having a non-circular cross section and with said projections flaring outwardly in the axial direction toward the front end of said barrel when in said clamping position,

(3) the inwardly facing surfaces of said collet members, when in said clamping position, being dimensioned for clamping an axially elongated lead therebetween;

(d) actuating means accessible outside said barrel at the rear end thereof for axially moving said collet means in the axial direction thereof within said barrel;



(e) a clamping ring being axially displaceably positioned within said barrel and having an axial bore laterally encircling the axis of said barrel and said second portions when said collet members are in the clamping position, said bore having a generally circular cross-section with a portion of said bore having a non-circular cross section,

(1) said collet members extending through said bore in said clamping ring,

(2) said portion of said bore being dimensioned for the axial passage of said second portions through said ring in a first angular position about said axis of said barrel of said collet means relative to said ring while preventing the axial passage of said second portions relative to said ring in a second angular position of said collet means and of said ring,

(3) said bore having an orifice at the end of said clamping ring closer to the front end of said barrel with at least a portion of said bore forming the orifice flaring in said axial direction corresponding to the flaring of said projections on said second portions and conforming to the shape of said projections for abuttingly receiving said projections of said second portions and holding the received said projections in said clamping position when said collet means are in a predetermined axial position and in said second angular position; and

(f) cooperating guide means on said collet members between said first and second axially terminal portions and in said bore of said ring for maintaining said collet members in said second angular position during movement of said collet members from said predetermined axial position in said axial direction over a first distance with said first distance being limited by said stop surface in the front piece while with said front piece removed said collet members can be moved to a second distance from said predetermined axial position greater than the first distance whereby said guide means on said collet members and on said ring are axially displaced out of cooperating relation so that relative angular movement between said collet members and said ring from said second angular position to said first angular position can be effected.

4,230,414

RATCHET-ACTION HINGE DEVICE

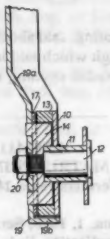
Ernest L. Cheshire, Hartwell, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 10, 1978, Ser. No. 950,184

Claims priority, application United Kingdom, Oct. 18, 1977, 43242/77

Int. Cl.[2] E05D *11/10*

U.S. Cl. 403—95 **3 Claims**



1. A hinge device for pivotally interconnecting two parts and including a ratchet mechanism comprising

a first ring member secured to one of said parts and carrying a row of ratchet teeth on its inner periphery,

a rotor member secured to the other of said parts for movement relative to the ratchet teeth about the axis of the hinge device, said rotor member being located concentrically within said first ring member,

a pawl carried by said rotor member and engageable with any selected one of said teeth to support said parts relative to each other in any selected one of a plurality of predetermined angularly-spaced positions corresponding to the angular spacing between the teeth of the ratchet mechanism,

de-activating means operable after the pawl has ratcheted across the last tooth in said row, as a result of relative rotation of said parts in one direction, to maintain the pawl out of engagement with the ratchet teeth and thereby allow relative rotation of said parts in the opposite direction until the pawl has cleared the ratchet teeth in said opposite direction,

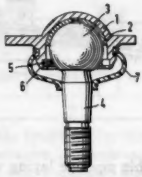
said de-activating means comprising a second ring which is concentric with the first ring member and is engageable with the pawl in response to movement of said members into a first relative position, is disengageable from the pawl in response to movement of said members into a second relative position, and holds said pawl away from said ratchet tooth over the path of movement of said members between said first and second positions, said second ring being mounted for movement with said pawl along a path disposed adjacent said ratchet teeth, said second ring including a radially inwardly projecting detent behind which said pawl can engage in response to movement of the pawl as said members enter said first relative position, the said second ring being coupled to said rotor member for movement therewith between said first and second positions, the detent holding the pawl at a radial distance from the hinge axis at which it clears the

ratchet teeth, movement of the pawl into said second position causing release of the pawl from the detent, the second ring being disposed adjacent the first ring in the axial direction, the pawl being elongate axially to bridge across both said rings and engage either said ratchet teeth or said detent.

4,230,415
BALL-JOINT WITH LOCKING DEVICE

Wolfgang Scheerer, Meerbusch, Fed. Rep. of Germany, assignor to A. Ehrenreich GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,467
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757198
Int. Cl.³ F16C *11/00*; F16D *1/12*
U.S. Cl. 403—122 **5 Claims**



1. In a ball-joint assembly, including a hollow housing having an opening on one side,
comprising in combination:
a generally hemispherical ball socket within said housing:
a ball, including a part in contact with said socket;
a pin shaft extending from said ball through said opening;
supporting means in said housing near said opening; and a discontinuous elastically deformable, but operatively rigid and closed locking ring supported by said supporting means and at least partly surrounding a portion of said ball, having an inner width smaller than the largest diameter of the ball, and being positioned between said largest diameter of said ball and said supporting means, whereby the ball is restrained from being removed off said ball socket when said pin shaft is pulled in a direction away from said ball socket.

4,230,416
RESTRICTED SLOT NAIL OPENINGS FOR SHEET METAL FRAMING CONNECTORS

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Oct. 15, 1979, Ser. No. 84,722
Int. Cl.³ F16B *9/00*; E04B *1/38*
U.S. Cl. 403—232.1 **9 Claims**

1. A metal connector for joining first and second wood members which intersect at an angle of less than 90 degrees comprising:

a. a first member having a planar section adapted for flush mounting against said first member formed with a first restricted slot opening therethrough;

b. a second member joined to said first member and intersecting said first member at an angle less than 90 degrees and having a planar section adapted for flush mounting against said second wood member;

c. a first nail fastener having a shank with a uniform diameter and a head having a diameter greater than the diameter of said shank, adapted for being driven into said first wood member;

d. said first nail fastener and said planar section of said first member form a first selected angle; and

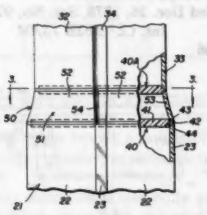
e. said first restricted slot opening is formed with a width slightly larger than the diameter of said first nail fastener and is formed with a length greater than the diameter of said first nail so that when said first nail is inserted through said first restricted slot opening at said first selected angle

the diagonally opposed outer edges of the sides of said first restricted slot opening tangentially register with opposed sides of said first fastener and relative movement between said nail fastener and said connector is prevented.

4,230,417
MODULE FOR MODULAR TROPHY BASE

Allen Weiss, Chicago, Ill., assignor to Alamar Associates, Glenview, Ill.

Filed Feb. 16, 1979, Ser. No. 12,826
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—301 **10 Claims**

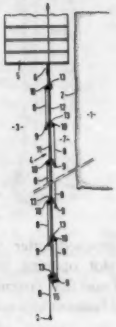


1. A transition module for use in constructing a modular trophy base which includes a column module having end plates at the upper and lower ends thereof, said transition module comprising a closed peripheral side wall having two opposite ends, the perimeter of one of said ends of said side wall defining a first predetermined closed figure and the perimeter of the other of said ends of said side wall defining a second predetermined closed figure substantially different from said first figure, at least one of said ends of said side wall being shaped and dimensioned for mating engagement with an end plate of the associated column module, the other of said ends of said side wall being shaped and dimensioned for mating engagement with an end plate of another associated member, whereby said transition module may form a transition between the associated column module and another member.

4,230,418
THERMAL PROTECTIVE DEVICE FOR TABULAR ICEBERGS

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Sep. 21, 1978, Ser. No. 944,286
Claims priority, application France, Oct. 3, 1977, 77 29630
Int. Cl.[2] E02B *1/00*
U.S. Cl. 405—52 8 Claims

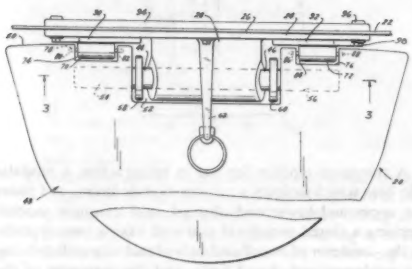


1. A protective device for thermally protecting the side of an iceberg floating in warm sea by producing a vertical layer of calm water between the protective device and the side wall of the protected iceberg, wherein a thermal protective device is suspended from a mechanical protective device floating in the warm seawater independently of the protected iceberg, and the thermal protective device comprises panels of material disposed at the side of the iceberg, each of said panels having a width greater than its height, being suspended from horizontal cables passing through a top hem of the panel and being stretched taut by a horizontal cable passing through a bottom hem of the panel, said horizontal cable being fastened to runners threaded onto a suspension cable and a lifting cable.

4,230,419
HINGED FLOAT ATTACHMENT SYSTEM

David F. McConaughy, East Aurora, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,091
Int. Cl.[2] E02B *15/04*
U.S. Cl. 405—66 11 Claims

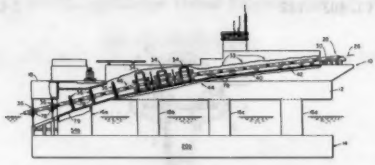


1. A float assembly adapted to be mounted on an elongated collapsible belt to form a floatable boom comprising; a support with attachment means for mounting the float assembly on the belt, a float member hinged to the support to be rotatable about an axis substantially parallel to the longitudinal axis of the belt between a first position adjacent to the belt for storage and a second position laterally extended from the belt for facilitating floatation of the boom, the float member being mounted for and restricted to limited angular displacement with respect to the longitudinal axis of the belt when in the second position and releasable means to retain the float member in the second position during use and releasable to permit the float to fall by gravity and rotate about the axis substantially parallel to the longitudinal axis of the belt into the first position in close adjacent relationship to the belt.

4,230,420
SEMI-SUBMERSIBLE PIPELAYING VESSEL HAVING AN IMPROVED PIPELAYING PATH

Fred I. Chow, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Oct. 12, 1978, Ser. No. 950,860
Int. Cl.[2] B63B *35/04;* F16L *1/04*
U.S. Cl. 405—166 8 Claims



1. A semi-submersible pipeline laying vessel comprising
an upper deck member having a longitudinally directed pass-through opening,
at least one lower submersible buoyancy member,
a plurality of bow-to-stern spaced support members connected between said buoyancy member and said deck member for supporting said deck member in an upward, spaced-apart relationship with said buoyancy member, at least one of said support members at a stern portion of the vessel having a longitudinally directed vertical cut-away section extending through an interior section thereof to define port and starboard portions of said at least one support member, and said section being aligned with said deck opening,
a pipelaying means partially supported by and above said deck member for fabricating a pipeline from a plurality of pipelengths, said pipelaying means comprising a plurality of operating stations arranged along a pipeline path, said path extending longitudinally of said vessel from an above deck position to a below deck position at the stern of said vessel, and in alignment with and passing through said deck pass-through opening and said one support vertical cut-away section,
whereby said pipeline is at least partially shielded from port and starboard directed lateral wave action forces by said one support when said pipeline is below the level of said deck member.

4,230,421
SELF PROPELLED DYNAMICALLY POSITIONED REEL PIPE LAYING SHIP

Charles N. Springett, Santa Ana; Dan Abramovich, Mission Viejo; Stanley T. Uyeda, Orange, and E. John Radu, Fountain Valley, all of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Filed May 5, 1978, Ser. No. 903,180
Int. Cl.[2] F16L *1/00;* B63B *35/04*
U.S. Cl. 405—168 39 Claims

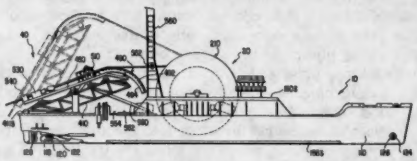
1. A reel pipelaying ship having forward, midship and stern sections, comprising:
port and starboard side outer longitudinally extending hull members;
port and starboard side pairs of inner longitudinally extending bulkheads;
a generally horizontal baseline at the ship's bottom;

a generally horizontal tank top spaced from and above the baseline;

a generally horizontal main deck spaced from and above the tank top;

a plurality of transverse bulkheads spaced fore and aft from each other, at least some of said transverse bulkheads extending substantially across the beam of the ship and others of said transverse bulkheads extending only partially across the beam of the ship, wherein said some and others of said bulkheads define at least in part a well adapted to receive a pipe-carrying reel;

port and starboard side upper and lower substantially horizontal midship structural members spaced one above the other and spaced from and above the main deck, said midship structural members extending longitudinally for



at least a part of the length of the ship, wherein said midship structural members, in combination with portions of said outer hull members and said inner longitudinal bulkheads extending above the main deck level, comprise a pair of port and starboard side boxbeam reel support structures;

a pipe-carrying reel; and

a pair of reel support bearing assemblies mounting said reel to said box-beam reel support structures such that the bearing assemblies rest on the upper end portions of a respective pair of said inner longitudinal bulkheads;

wherein said reel support structure distributes the load of said reel and bearings downwardly and longitudinally outwardly through said inner longitudinal bulkheads and transversely through said tank top and baseline.

4,230,422

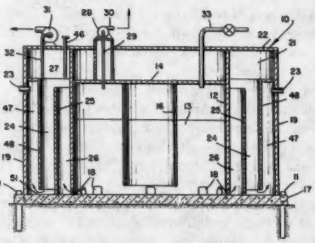
SUBMERGED OFFSHORE STORAGE FACILITY

George R. Brown, Lagos, Nigeria; Joseph C. Carroll, Abqaiq, Saudi Arabia, and S. Elliott Dubuisson, Kokkedal, Denmark, assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 925,133, Jul. 17, 1978. This application Mar. 19, 1979, Ser. No. 21,860

Int. Cl.[2] B65G *5/00*; E02D *27/38, 29/00*

U.S. Cl. 405—210 5 Claims



1. Method for subsea storage of a liquid having a lesser density than water, within a submerged storage tank having a storage compartment, and an overflow compartment communicated therewith, which method includes the steps of;

maintaining said submerged storage compartment full of water and said liquid having a lesser density than water, communicating the lower section of said storage compartment with the surrounding water to permit passage of the water to and from said tank storage compartment,

periodically introducing an amount of the less dense liquid into the storage compartment whereby to depress the level of the less dense liquid therein so as to discharge a stream of said water from the storage compartment lower end, said stream having a minor amount of the less dense liquid carried therewith,

passing said stream of displaced water and lighter liquid into said overflow compartment whereby to change the stream's directional flow,

permitting the respective liquids to separate in said overflow compartment whereby the lighter liquid rises to the surface, and the water continues through said overflow compartment, and

periodically removing the lesser density liquid from said overflow compartment, thereby avoiding inadvertent pollution by the less dense liquid, when water from the overflow compartment is passed to the seawater in which the storage tank is submerged.

4,230,423

ICE-BREAKING APPARATUS FOR STRUCTURE FOR USE IN ICY WATERS

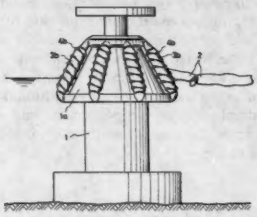
Masanao Oshima; Mikihisa Komoto; Shoichi Yabuki, and Tsuneo Inokawa, all of Tokyo, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1977, Ser. No. 854,104

Claims priority, application Japan, Nov. 24, 1976, 51-140222

Int. Cl.[2] E02B *17/00*; B63B *35/12*

U.S. Cl. 405—211 2 Claims



1. An ice-breaking apparatus for a structure used in water containing ice floes, said apparatus comprising:

a central mounting means having a downwardly expanding frustoconical shape mounted on said structure at the level of the ice floes;

a plurality of body means each said body means having a generally cylindrical shape with the axial centerlines of said plurality of body means forming a downwardly expanding frustoconical shape in outline, each said body means rotatably mounted on and spaced around the periphery of said central mounting means; and

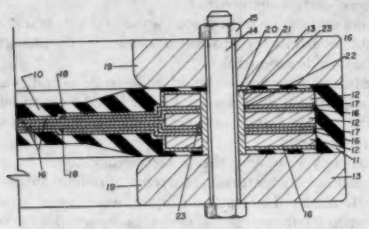
a spiral blade means mounted on a peripheral edge of each said body means;

wherein as said body means are rotated and the ice floes contact at least one spiral blade means, said spiral blade means is driven into an edge portion of the ice floe and either raises or lowers the ice floe to subject the ice floe to a bending force for causing the ice floe to break into relatively large plate-like pieces which are pushed sideways of said body means by virtue of said body means rotary action to effectively prevent damage to said central mounting means by the ice floe.

4,230,424
LEG CLOSURE

Bob L. Sullaway, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 31, 1979, Ser. No. 71,439
Int. Cl.³ E02D 5/52
U.S. Cl. 405—227 23 Claims



1. In combination, a diaphragm and annular diaphragm retaining means retaining said diaphragm therein, said diaphragm comprising:

flexible member means having a peripheral portion and an inner portion;

annular substantially rectangular cross-sectionally shaped reinforcing member means located in the peripheral portion of said flexible member means;

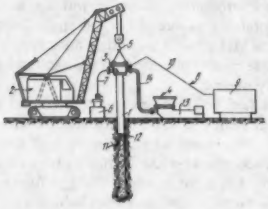
first reinforcing means having a peripheral portion bonded to said reinforcing member means and extending through the peripheral portion and through the inner portion of said flexible member means; and

second reinforcing means having a peripheral portion secured in the peripheral portion of said flexible member means and extending inwardly into the inner portion of said flexible member means and terminating inwardly of said reinforcing member means and the inner diameter of said annular diaphragm retaining means with said second reinforcing means overlaying a portion of the inner portion of said reinforcing means, whereby when said diaphragm is deformed into engagement with the inner diameter of said annular diaphragm retaining means, said second reinforcing means provides additional reinforcement to said diaphragm in the portion of said diaphragm deformed into engagement with said annular diaphragm retaining means.

4,230,425
METHOD AND INSTALLATION FOR PRODUCING CAST-IN-SITU PILES

Vladimir A. Gusev, Yaroslavov val. 15a, kv. 5; Jury I. Oprisko, ulitsa Bogomoltsa, 7/14, kv. 18, both of Kiev, and Alexandr P. Sorochinsky, ulitsa Vokzalnaya, 19, kv . 49, poselok Glevakha, Kievskoi oblasti, all of U.S.S.R.

Filed Mar. 19, 1979, Ser. No. 21,490
Int. Cl.³ E02D 5/38, 7/18, 7/26, 7/28
U.S. Cl. 405—239 48 Claims



1. A method for producing cast-in-situ piles, comprising setting a casing pipe on the ground, feeding a fluid into the casing pipe, passing electric pulses through the fluid to produce electric discharges having parameters such that permit hydraulic shock waves to be formed at the lower portion of said casing pipe, acting on the ground and on said casing pipe so as to drive the latter into the ground to a prescribed depth, whereafter the casing pipe is pulled from the ground as concrete mix is concurrently fed into said casing pipe and electric discharges are produced in the concrete mix to compact it.

29. An installation for producing cast-in-situ piles, comprising:

a casing pipe having an upper butt end and a lower butt end;

a pile puller coupled to said casing pipe and intended to set said casing pipe on the ground, support it and pull it from the ground;

a pile driver coupled to said casing pipe and comprising:

a fluid feed system communicating with said casing pipe;

a pulse device comprising: electrodes installed in said casing pipe close to its lower butt end;

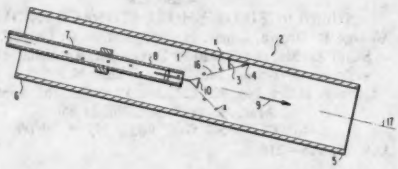
an electric pulse generator arranged in proximity to said casing pipe, electrically connected to said electrodes and intended to generate electric pulses to produce electric discharges between said electrodes, whereby hydraulic shock waves are formed in the fluid fed into said casing pipe, which act on the ground and on said casing pipe and drive said casing pipe into the ground;

a concrete feeder operably coupled to said casing pipe and intended to feed concrete mix into said casing pipe as it is pulled from the ground.

4,230,426
METHOD FOR TREATING CONDUIT TO IMPROVE FLOW CHARACTERISTIC AND RESULTING CONDUIT PRODUCT

Hugh E. Avery, Jr., Houston, and Jerome I. Paulson, Spring, both of Tex., assignors to Allied Industries, Inc., Houston, Tex.

Filed Mar. 20, 1979, Ser. No. 22,095
Int. Cl.³ B65G 53/00
U.S. Cl. 406—191 6 Claims



1. In a method of reducing the formation of fines and streamers in the gas conveying of plastic particles wherein

the interior of a plurality of particle conveying conduit sections are treated by

shot-peeing the interior wall means of each of said sections, with shot being impacted against said wall means of each of said section at an acute, impacting angle, the apex of which points generally longitudinally of each said section toward one end thereof;

the improvement comprising:

assembling said plurality of shot-peened, particle conveying conduit sections to define conduit means wherein the apexes of said acute, impacting angles all point generally in an intended longitudinal flow direction of said plastic particles;

flowing said plastic particles through said assembly of shot-peened particle conveying conduit sections in said intended flow direction with

the generally longitudinal flow direction of said particles through each said section forming, at the shot-peened interior wall means thereof, an acute, particle flow to shot impact directions related angle, with respect to the direc-

tions of impacting of said shot, with these angles being oriented in each of said sections with the angle apex thereof generally pointing toward said one end thereof; and

maintaining said orientation of said particle flow to shot impact related angles through said conduit means, thereby reducing the level of fines which would be generated by a reversal of said flow direction of said plastic particles.

4,230,427

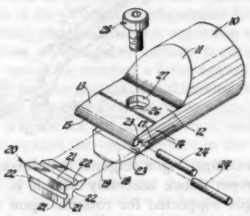
BOTTOM FACE MILL

Stanley C. Belttari, 4451 Cedar, West Bloomfield, Mich. 48013, and Mark Jacobson, 3865 Benstein, Milford, Mich. 48042

Filed Dec. 6, 1978, Ser. No. 966,784

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—91 **2 Claims**



1. The combination of a tool and a holder, characterized in that:

(a) the holder comprises an elongated body which has a front end provided with a V-shaped transverse notch that has two inwardly converging wall surfaces;

(b) said holder body has a transverse, longitudinal slot, in the front end thereof, and the inner ends of the converging wall surfaces of said V-shaped notch terminate at the outer end of said longitudinal slot so as to communicate with said slot and divide the front end of the elongated holder body into a pair of spaced apart clamping jaws;

(c) a triangular cutting tool is seated in said V-shaped notch;

(d) there is means for releasably securing said triangular cutting tool in said V-shaped notch in said holder body;

(e) said means for releasably securing said cutting tool in said V-shaped notch in said holder including retainer pin means operatively mounted between the holder body and the triangular cutting tool; and,

(f) said retainer pin means includes at least one retainer pin which is operatively mounted in an elongated hole formed by a pair of opposing half-round grooves which are formed with one half-round groove in the holder body and with the other half-round groove in the triangular cutting tool.

4,230,428

MATERIAL SAVING CUTTER BLADE

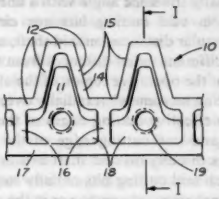
Edward W. Haug, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Continuation of Ser. No. 790,779, Apr. 25, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,851

Int. Cl.³ B26D *1/00, 1/12*

U.S. Cl. 407—116 **6 Claims**

1. A chip removing cutter blade for use in metal working comprising a monolithic body of molded metal cutting material with a plurality of deep material saving recesses molded therein, a substantially flat base, a wall extending from a side of said base, a plurality of spaced abutments interconnecting the wall and said base; said base, the wall and said plurality of abutments defining said plurality of deep material saving recesses; an outside of said wall ground to the desired cutting contour for said cutting blade, and the top of said wall ground



to produce a cutting face, the intersection of said cutting face and the contoured outside of said wall creating a cutting edge.

4,230,429

BORING TOOL FOR MAKING BORINGS IN SOLID METAL MATERIAL OF WORKPIECES

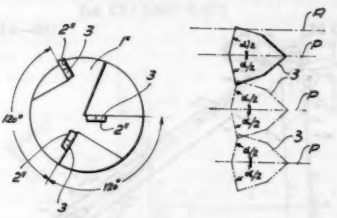
Otto Eckle, Löchgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,532

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 7721135

Int. Cl.³ B23B *51/00*

U.S. Cl. 408—186 **8 Claims**



1. A boring tool comprising a shaft and at least two cutting bits, each said bit being hexagonal with its cutting edges equally long and arranged in pairs, said cutting bits being exchangeable and each arranged in a respective recess facing in the direction of rotation of said shaft, each said cutting bit having one said pair of its said cutting edges arranged for simultaneous effective engagement with a workpiece, said pair of effective cutting edges of every cutting bit forming an obtuse angle (α) therebetween straddling a line parallel to the shaft axis and each defining substantially the same angle ($\alpha/2$) with said line parallel to the shaft axis, wherein said cutting bits are circumferentially spaced at equal angular distances on said shaft, said cutting bits being located at different radial distances from the axis of said shaft and such that the operative region of the effective cutting edges of each cutting bit somewhat radially overlaps the operative region of the effective cutting edges of the radially adjacent cutting bit, and one effective cutting edge of the radially inner cutting bit borders directly on said shaft axis or slightly overlaps same, the radially outermost cutting bit having its radially outermost effective cutting edge of its pair of effective cutting edges extending radially outward beyond the shaft periphery and meeting the adjacent cutting edge of the adjacent cutting edge pair in a further angle less than said obtuse angle (α) such that said adjacent cutting edge angles away from and does not engage the peripheral wall of a hole bored by said tool and converges toward the axis of the shaft.

8. A boring tool comprising a shaft and at least two cutting bits, each said bit having several equally long cutting edges, said cutting bits being exchangeable and each arranged in a respective recess facing in the direction of rotation of said

shaft, each said cutting bit having two of its said cutting edges arranged for simultaneous effective engagement with a workpiece, said two effective cutting edges of every cutting bit each defining substantially the same angle with a line parallel to the shaft axis, wherein said cutting bits are circumferentially spaced at equal angular distances on said shaft, said cutting bits being located at different radial distances from the axis of said shaft and such that the operative region of the effective cutting edges of each cutting bit somewhat radially overlaps the operative region of the effective cutting edges of the radially adjacent cutting bit, and one cutting edge of the radially inner cutting bit borders directly on said shaft axis or slightly overlaps same, in which said cutting bits radially stepped out from said shaft axis are progressively narrower in the radial extent of their cutting edge pairs.

4,230,430

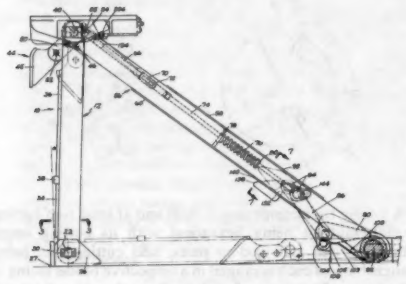
COLLAPSIBLE FIFTH WHEEL TRAILER HITCH LOCKED POSITION INDICATOR

Patricia S. Stoller, 1450 Ann Arbor Rd. #34 Plymouth Sq., Plymouth, Mich. 48170; James C. Hammonds, 10C Fairway Cir., St. Charles, Mo. 63301, and Ronald D. Van Dyke, 26 Hammes, Florissant, Mo. 63031

Filed Jan. 31, 1979, Ser. No. 8,224

Int. Cl.³ B60P *3/06*; B61D *45/00*; B65J *1/22*

U.S. Cl. 410—59 **4 Claims**



1. In a piggyback railway trailer hitch, including a vertical strut and a partially hollow diagonal strut, at least one movable, hook-shaped locking lug pivotably mounted about a pin in the diagonal strut; said movable locking lug adapted to engage a fixed locking lug located on the side of the hitch when said hitch assumes the upright position; a link extending from the distal end of the movable locking lug to a shaft located in the diagonal strut; said shaft extending transversely of the hitch; an indicating arm pivotably mounted upon said diagonal strut and located above the deck of the car; said indicating arm including a lower surface which engages the shaft; said lower surface including a slot which the shaft engages when said movable locking lug is locked in the upright position; said indicating arm having a distal end which extends into view below the diagonal strut when said shaft engages said slot to indicate to the operator that the hitch is locked in the upright position; the lower surface of said indicating arm including a surface portion laterally spaced from said slot which said shaft engages when said movable locking lug is in the disengaged position with said fixed locking lug, whereby when said shaft engages said surface portion, said indicating arm is pivoted to a position located within said diagonal strut to indicate to the operator that the hitch is in the unlocked, upright position.

4,230,431

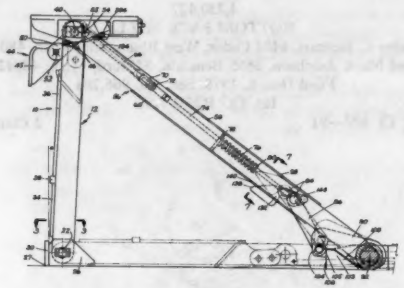
TRACTOR OPERATED FIFTH WHEEL HITCH STAND DIAGONAL STRUT LINKAGE

Patricia S. Stoller, 1450 Ann Arbor Rd. #34 Plymouth Sq., Plymouth, Mich. 48170; James C. Hammonds, 10C Fairways Cir., St. Charles, Mo. 63301, and Ronald D. Van Dyke, 26 Hammes, Florissant, Mo. 63031

Filed Jan. 31, 1979, Ser. No. 7,863

Int. Cl.³ B60P *3/06*; B61D *45/00*; B65J *1/22*

U.S. Cl. 410—59 **7 Claims**



1. A trailer hitch comprising: a diagonal strut linkage rigidly attached to a bumper block assembly which is pivotably mounted about a pin supported for rotation upon a vertical strut; said linkage extending within a hitch diagonal strut; a transversely extending shaft attached to the lower portion of said linkage; at least one movable locking link attached to an outer end of said shaft; said movable locking link engaging the distal end of a locking member pivotably mounted upon a bar located at the lower end of the diagonal strut; said locking member engaging at least one fixed locking lug when said diagonal strut linkage is in the extended position within said diagonal strut; resilient means biasing said linkage into a downward position within said strut; and guide means located within said diagonal strut allowing vertical movement of said linkage within said strut as said linkage rotates about said pin as said linkage is moved longitudinally within said strut against the bias of said resilient means; said guide means comprising a guide plate located in said diagonal strut rigidly connected to said diagonal strut having a vertical slot therein for effecting said vertical movement; and said resilient means comprising a spring attached to said guide plate and to a spring plate attached to said linkage.

4,230,432

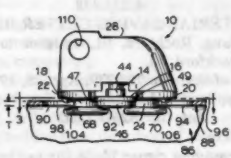
TRACK FASTENER

Russell B. Howell, Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Germantwon, Md.

Filed Feb. 27, 1979, Ser. No. 16,123

Int. Cl.³ B60N *1/08*; B60P *7/08*; B61D *45/00*

U.S. Cl. 410—102 **8 Claims**



1. Track fastener apparatus having an unlocked and locked configuration for use with a locking track with an upper surface portion having an upper and lower surface with a slot with spaced cut-out portions extending through the upper

surface portion from the upper to the lower surface thereof comprising: a track fastener housing having an upper portion and a lower portion and a threaded aperture extending from the upper portion to the lower portion thereof; means connected to said housing for exerting pressure against the lower surface of the upper surface portion of said locking track at two separate locations along said locking track between said spaced cut-out portions when said track fastener apparatus is in the locked configuration; said means for exerting pressure against the lower surface at two separate locations along said locking track comprising two separated track studs each having an upper portion connected to the lower portion of said track fastener housing on opposite sides of the threaded aperture in said track fastener housing and each having an enlarged lower end portion adapted to fit into the cut-out portions of the upper surface portion of said locking track; plastic sliding means located on the lower portion of said track fastener housing in position to bear upon the upper surface of the upper surface portion of said locking track when said track fastener apparatus is in the unlocked configuration for reducing friction and permitting said track fastener apparatus to be slid along the upper surface of the upper surface portion of said locking track; and means for exerting a force against the upper surface of the upper surface portion of said locking track in the vicinity of one of said spaced cut-out portions when said track fastener apparatus is in the locked configuration; said means for exerting a force against the upper surface in the vicinity of one of said spaced cut-out portions including a track wedge member with an upper surface having a centrally located aperture extending to the upper surface and a locking screw having an unthreaded portion with an end portion sized to slip into the aperture in said track wedge member, said locking screw having an enlarged section located adjacent to the end portion creating a shoulder adapted to contact and exert force upon the upper surface of said track wedge member and a cylindrical threaded portion insertable into the threaded aperture extending from the upper portion to the lower portion of said track fastener housing; said track wedge member having a lower portion sized to be received in the cut-out portions of the upper surface portion of said locking track and an enlarged upper portion adapted to contact the upper surface of the upper surface portion of said locking track in the vicinity of the cut-out which receives the lower portion of said wedge member when said track fastener apparatus is in its locked configuration.

4,230,433

BALE COLLECTOR

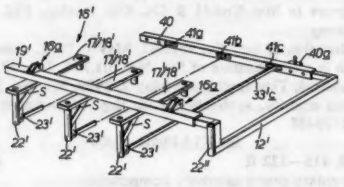
Michael V. Jackson, Hethersett, England, assignor to Farmhand (U.K.) Limited, Wymondham, England

Continuation of Ser. No. 722,630, Sep. 13, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,394

Claims priority, application United Kingdom, Sep. 15, 1975, 37786/75

Int. Cl.[2] A01D *87/12*

U.S. Cl. 414—111 **1 Claim**



1. A releasable attachment for the conversion into a combined collector/loader of a bale loading mechanism having a main frame which supports bale-gripping means and is adapted to be mounted on an agricultural tractor for transport of bales gripped by the bale-gripping means, wherein said attachment comprises a sub-frame which carries a set of bale-guiding components constructed and adapted to cause bales to be guided into their respective relative positions in an array which can be gripped in its entirety by said gripping means, and further comprises connecting means releasably engagable with cooperating means on said main frame for securing said sub-frame in correct working relation to said main frame and securing means for releasably securing said sub-frame to said main frame in said correct working relation, and wherein said connecting means on said sub-frame are spaced apart on a front member thereof for engagement with correspondingly spaced cooperating means on a front member of said main frame in such manner that when engaged, rearward and vertical movement of said sub-frame relative to said main frame are precluded, and wherein said securing means are located on a rear member of said sub-frame, said arrangement permitting connection of said bale loading mechanism to said attachment by lowering the mechanism onto the attachment, engaging said connecting means with said cooperating means by forward movement of said bale-loading mechanism relative to the attachment, and securing said sub-frame to said main frame by said securing means.

4,230,434

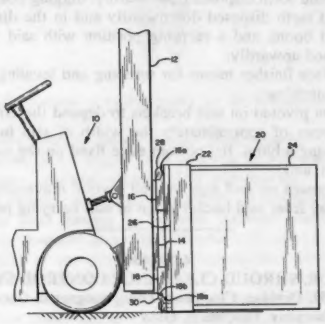
LIFT TRUCK LOAD-HANDLING ATTACHMENT HAVING INTEGRAL QUICK-DISCONNECT HOOK

Richard D. Seaberg, Vancouver, Wash., assignor to Cascade Corporation, Portland, Oreg.

Filed Aug. 24, 1979, Ser. No. 69,599

Int. Cl.[3] B66F *9/075*

U.S. Cl. 414—607 **10 Claims**

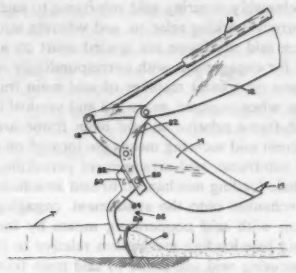


1. A load-handling attachment, adapted for mounting upon the front of a vertically-movable lift truck load carriage having an attachment mounting member thereon of the type which includes a lip having a rearwardly-facing surface, comprising: a frame with a rearwardly-facing surface adapted to abut against the front of said load carriage; hook means mounted upon the rearwardly-facing surface of said frame for selectively matingly engaging or disengaging said lip, said hook means comprising a lug pivotally attached to the rearwardly-facing surface of said frame so as to rotate about an axis extending generally from the front to the rear of said frame, said lug having engagement means for matingly engaging the rearwardly-facing surface of said lip when said lug is in a predetermined rotatable position relative to said frame; locking means attached to said hook means and said frame for selectively locking said lug, to prevent rotation thereof from said predetermined rotatable position, or unlocking said lug so as to permit rotation thereof; and means interconnecting said locking means with said frame for preventing detachment of said locking means from said frame during selective locking and unlocking of said lug by said locking means.

4,230,435
BACKHOE FINISHING TOOL

Albert J. Azevedo, 1171 Limerick La., Healdsburg, Calif. 95448

Filed Jul. 21, 1978, Ser. No. 927,171
Int. Cl.³ E02F 3/81
U.S. Cl. 414—722 3 Claims

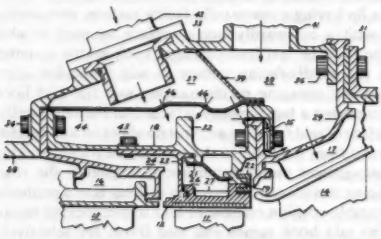


1. In combination with a backhoe including:
a boom;
a bucket pivotally mounted on the end of said boom;
a row of teeth along the lip of said bucket;
a pair of generally parallel brackets along the back of said bucket;
a pair of links connecting said bracket and said boom; and
hydraulic means connecting said boom and said links for tilting said bucket between a raking position with the ends of said teeth disposed downwardly, digging position with said teeth disposed downwardly and in the direction of said boom, and a carrying position with said teeth disposed upwardly;
a surface finisher means for scraping and leveling a trench comprising:
an arm pivoted on said brackets to depend therefrom;
a scraper of approximately the width of said bucket and having a blunt, flat bottom edge fixed on the end of said arm; and
stop means on said arm to limit pivotal movement thereof away from said bucket when in said carrying position.

4,230,436
ROTOR/SHROUD CLEARANCE CONTROL SYSTEM

Samuel H. Davison, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 17, 1978, Ser. No. 925,352
Int. Cl.³ F01D 11/08
U.S. Cl. 415—1 37 Claims

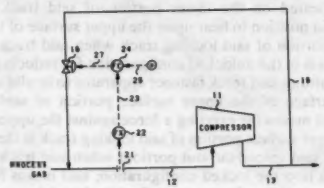


1. In combination with apparatus of the type having a variable speed rotor, a shroud, and a shroud support with the shroud surrounding the rotor, an improved air delivery system for modulating thermal growth of the shroud support comprising:
(a) means for sensing the operating speed of the rotor;
(b) means for timing the operation of the rotor after an acceleration; and
(c) means responsive to said timing means and to the speed of the rotor for varying the temperature of the air.

4,230,437
COMPRESSOR SURGE CONTROL SYSTEM

Robert M. Bellinger, and Hadwen A. Clayton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 15, 1979, Ser. No. 48,969
Int. Cl.³ F04D 27/02
U.S. Cl. 415—1 8 Claims



1. Apparatus comprising:
a compressor means having a discharge outlet and a suction inlet;
first conduit means for supplying a gas to the suction inlet of said compressor means;
second conduit means for removing the compressed gas from the discharge outlet of said compressor means;
third conduit means for recirculating gas from said second conduit means to said first conduit means;
a control valve means operably located in said third conduit means;
means for establishing a first signal representative of the flow rate of gas through said first conduit means;
means for establishing a set point signal which varies in response to the position of said control valve means;
means for comparing said first signal and said set point signal and for establishing a second signal responsive to the difference between said first signal and said set point signal; and
means for manipulating said control valve means in response to said second signal to thereby control the flow of gas through said third conduit means so as to both prevent surging of said compressor means and substantially minimize the recirculation of gas from said second conduit means to said first conduit means.

4,230,438
ROTARY PUMP ASSEMBLY

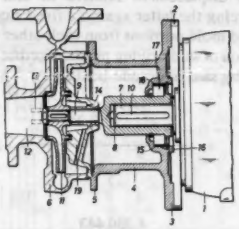
Wilfried Lehmann, Heiligenstedten; Hermann Muller, Oldendorf, and Bodo Baranek, Wilster, all of Fed. Rep. of Germany, assignors to Sihi GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

Continuation of Ser. No. 901,842, May 1, 1978, abandoned, which is a continuation of Ser. No. 701,754, Jun. 30, 1976, abandoned. This application May 2, 1979, Ser. No. 35,224
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1975, 2529458
Int. Cl.³ F04D 29/04
U.S. Cl. 415—122 R 4 Claims

1. A rotary pump assembly comprising:
a pump having a pump housing;
a pump shaft disposed within said pump housing;
a runner mounted concentrically on said pump shaft;
a motor having a motor housing a shaft coaxially aligned with said pump shaft;
an intermediate housing interconnected between said pump

and motor housings, said pump shaft having an end facing said motor, the pump shaft end being formed as a hollow shaft fittingly mounted coaxially on said motor shaft and secured for rotation therewith to form a cantilever arrangement thereon; and

bearing support means disposed in said intermediate housing and engaging said hollow shaft for supporting said pump shaft end for resisting only axial forces applied to said



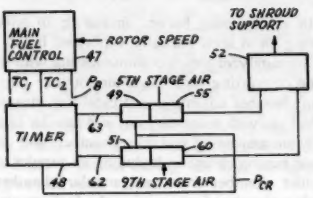
pump shaft, said bearing support means consisting solely of an axial bearing engaging and securing said pump shaft end axially in said intermediate housing, radial forces applied to said pump shaft being resisted by the motor shaft, said intermediate housing having a bore, said axial bearing being axially secured to said intermediate housing in said bore and axially fixed with respect to said hollow shaft at locations where said hollow shaft receives said motor shaft.

4,230,439

AIR DELIVERY SYSTEM FOR REGULATING THERMAL GROWTH

Joseph P. Smith, Jr., Cincinnati; Robert L. Mentzer, Wyoming, and Dana D. Freberg, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 17, 1978, Ser. No. 925,353
Int. Cl.³ F01D *11/08*
U.S. Cl. 415—138 **23 Claims**



1. In combination with apparatus of the type having a compressor, a rotor, a shroud, a shroud support surrounding the rotor, an air delivery system for providing air at varying temperatures to the shroud support comprising:

(a) first and second air sources, the temperature of said second air source being higher than that of said first air source;

(b) first and second air valves for controlling the flow of air from said first and second air sources, respectively, to a manifold;

(c) means for delivering air from the manifold to the support; and

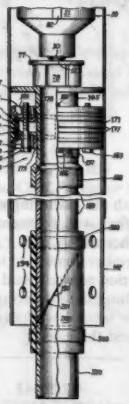
(d) valve means responsive to the speed of said rotor and to the time after reaching predetermined rotor speeds for operating said first and second air valves, said valve means including a timer valve which is activated when the speed of the rotor reaches a predetermined level with said timer valve including a piston which advances at a first substantially constant rate of speed upon receiving a first predetermined rotor speed signal and which retracts at a second substantially constant rate of speed upon receiving a second predetermined rotor speed signal, wherein said valve means operates said first and second air valves in response to translation of said piston.

4,230,440

THROUGH FLOW SUMP PUMP

Karl O. Niedermeyer, 17WO68 North St., Bensenville, Ill. 60106

Division of Ser. No. 793,402, May 3, 1977, Pat. No. 4,177,021.
This application Apr. 4, 1979, Ser. No. 26,921
Int. Cl.³ F04B *35/04*
U.S. Cl. 417—424 **3 Claims**



1. A pump for use as a sump pump or the like and comprising:

an electric motor including a waterproof housing of a given diameter, and a motor shaft defining an axis and with a portion of the shaft externally of said housing;

a pump impeller affixed to said portion of said shaft;

a pump shell having an internal diameter substantially greater than said given diameter and with ends beyond the impeller in one direction and beyond the motor in the other direction; and

a reducer having a large end secured to said shell adjacent the first mentioned end, a tube mounted in said large end of the reducer for movement longitudinally along said axis and having portions at the impeller side of said large end and also at the opposite side thereof, said portion of the impeller side including a plate normal to the axis and having a periphery in juxtaposition to the inside of said pipe, said tube forming the intake for said pump.

4,230,441

OUTSIDE CORNER FINISHING TOOL

Joseph D. Heronema, 16309 Bellbrook, Covina, Calif. 91723

Filed Nov. 17, 1978, Ser. No. 961,620
Int. Cl.² E04F *21/08*
U.S. Cl. 425—87 **11 Claims**

1. A tool for simultaneously finishing first and second walls adjacent the edge of an outside corner with plastering material, the tool including:

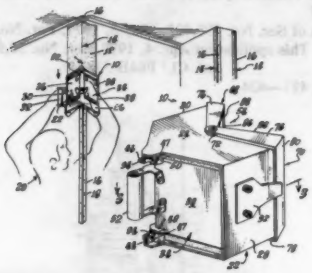
a housing having perpherial walls constituting first and second side portions corresponding to the first and second walls, a back piston and a front which is at least partially open to form a container for the plastering material;

means for applying force to said back piston to move said back piston toward said front so that the plastering mate-

rial can be forced toward said front and simultaneously applied to the first and second walls about the corner;

at least two guide means adapted to track along the edge of the corner connected to said housing in position to engage the edge of the corner when plastering material is being applied thereto;

a first wiper member connected to said housing about said first side portion adjacent said front thereof in position to



smooth and finish the plastering material as the material is applied to the first wall adjacent the corner and as said tool is moved therealong; and

a second wiper member connected to said housing about said second side portion adjacent said front thereof in position to smooth and finish the plastering material as the material is applied to the second wall adjacent the corner and as said tool is moved therealong.

4,230,442

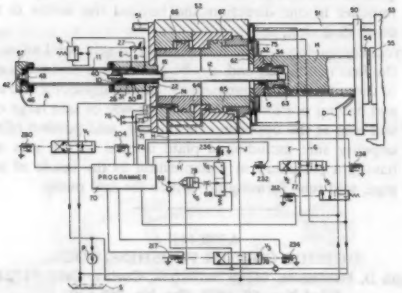
MOLD-CLAMPING MECHANISM FOR INJECTION-MOLDING MACHINE

Herbert Rees, Willowdale, and Allan H. Robinson, Mississauga, both of Canada, assignors to Husky Injection Molding Systems Limited, Bolton, Canada

Filed Aug. 21, 1979, Ser. No. 68,497

Int. Cl.[2] B29C *1/16*; B29F *1/00*

U.S. Cl. 425—451.2 **5 Claims**



1. In an injection-molding machine provided with a fixed platen, a movable platen and actuating means for reciprocating said movable platen along an axis with reference to said fixed platen between a mold-open and a mold-closed position,

the improvement wherein said actuating means comprises:

a stationary cylinder provided with a driving piston reciprocable under pressure of a hydraulic liquid admitted into said cylinder;

a thrust member rigid with said movable platen and connected with said driving piston by a lost-motion coupling;

clamping means operable in an advanced position of said driving piston, with said movable platen approaching said mold-closed position, to impart an extra forward motion to said thrust member independently of said driving piston within the limits of relative displaceability provided by said lost-motion coupling to complete the establishment of said mold-closed position; and

unclamping means hydraulically operable in said mold-closed position for subjecting said thrust member to a rearward displacement relative to said driving piston while forcing the latter against a fixed stop, thereby separating said mold portions from each other preparatorily to a retraction of said driving piston together with said thrust member by said hydraulic liquid.

4,230,443

VAPORIZING BURNER

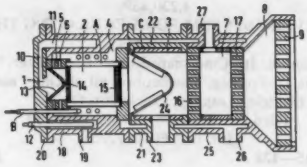
Hermann O. Berg, Florstadt; Peter Gulden, Erlangen; Hana Kostka, Nuremberg, and Alfred Michel, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 27, 1979, Ser. No. 16,329

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811273

Int. Cl.[3] F23D *13/14, 13/40*

U.S. Cl. 431—328 **12 Claims**

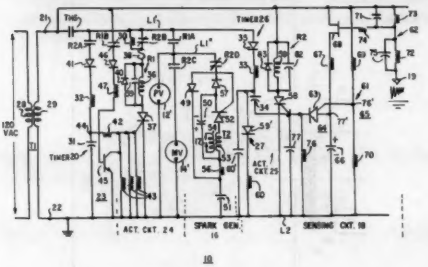


1. In a vaporizing burner, including an inlet chamber for admixing an at least partially vaporized liquid fuel with primary air; catalyzer means communicating with said inlet chamber for converting said vapor-air mixture into a fuel gas; a mixing chamber adjoining said catalyzer means for admixing said fuel gas with secondary air; and annular chamber concentrically encompassing said inlet chamber, said catalyzer means and said mixing chamber, including an annular wall separating said inlet chamber from said annular chamber; a conically widening chamber for receiving the fuel gas-air mixture from said mixing chamber; and an apertured burner plate of a porous material closing off said widening chamber, the improvement comprising; an antechamber arranged ahead of said inlet chamber, an annular passageway completely surrounding said inlet chamber and encompassing said annular chamber and said catalyzer means for at least a portion of their lengths, said antechamber including a transition into said annular passageway; a first heat source in said annular passageway for the vaporization of said fuel; a second heat source in said annular chamber for preheating of the primary air during burner start-up and for support during load changes, radial passageways in said annular wall for communicating said annular chamber with said inlet chamber; first and second homogenizing means being arranged in, respectively, said inlet chamber and in said mixing chamber; and an ignition chamber being positioned intermediate said conically widening chamber and said mixing chamber, said ignition chamber being separated from said mixing chamber so as to prevent backfiring of the ignited fuel gas.

4,230,444
METHOD AND APPARATUS FOR FUEL IGNITION SYSTEM INCLUDING COMPLETE CYCLING OF FLAME RELAY PRIOR TO TRIAL FOR IGNITION

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Apr. 17, 1978, Ser. No. 897,761
Int. Cl.³ F23Q 9/08
U.S. Cl. 431—6 **23 Claims**



10

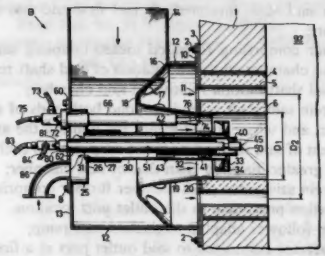
1. In a fuel ignition system including a pilot valve operable when energized to supply fuel to a burner for ignition by sparks provided by a spark generating means to provide a pilot flame, and a main valve operable when energized to supply fuel to said burner for ignition by the pilot flame, a control arrangement comprising: activate means for generating a start signal to initiate an ignition cycle; timing circuit means including a capacitor which is charged to a given value at the start of the ignition cycle and then discharged, permitting said timing circuit means to generate an enabling signal during a trial for ignition interval defined by the discharge time of said capacitor; first switching means for controlling the operation of said pilot valve; actuating means responsive to said enabling signal to enable said first switching means to energize said pilot valve during said trial for ignition interval; said timing circuit means normally terminating said enabling signal at the end of said trial for ignition interval to disable said actuating means whereby said first switching means is disabled, and flame sensing means operable when a flame is provided at said burner during said time interval to generate a control signal for application to said timing circuit means to cause said timing circuit means to continue to provide its enabling signal after the end of said trial for ignition interval to maintain said actuating means and thus said first switching means operated after said trial for ignition interval, said flame sensing means including control means and second switching means controlled by said control means to be enabled when a flame is sensed during said trial for ignition interval to energize said main valve.

4,230,445
BURNER FOR A FLUID FUEL

Hermann J. Janssen, Langnau, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jun. 15, 1978, Ser. No. 915,724
Claims priority, application Switzerland, Jun. 17, 1977, 7451/77
Int. Cl.³ F23L 7/00
U.S. Cl. 431—116 **24 Claims**

1. A burner for a fluid fuel, said burner comprising a fuel supply;
means defining a first inner annular space for connection to a source of fresh air and having a plurality of swirl-inducing elements therein;
means defining a second annular space for connection to a source of flue gas/air mixture about said first annular space and having a plurality of swirl-inducing elements therein;
means defining a third annular space about said second annular space for connection to a source of flue gas/air mixture; and

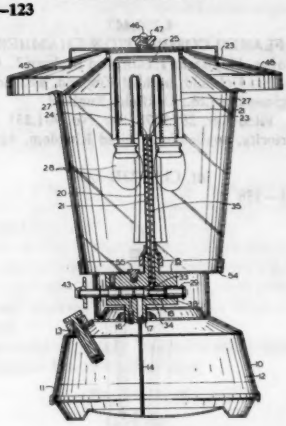


means defining a plurality of circumferentially distributed straight passages disposed around said third annular space and connected to a source of flue gas/air mixture.

4,230,446
CAMP LANTERN

Robert E. Fisher, Glendora, Calif., assignor to Acroform Corporation, Los Angeles, Calif.

Filed Jun. 5, 1978, Ser. No. 912,507
Int. Cl.³ F23D 11/38
U.S. Cl. 431—123 **8 Claims**



1. A camp lantern spool valve assembly comprising;
a hollow cylindrical valve chamber comprising in positional order
(a) a sealed first end;
(b) an outlet port;
(c) a fuel inlet;
(d) an air inlet; and
(e) an open second end;
a valve shaft axially slidably mounted within said chamber;
means for limiting the axial movement of said shaft in said chamber, and
first and second sealing means on said shaft for sealing the space between said shaft and said chamber;
said first sealing means positioned intermediate said second end and said air inlet; and
said second sealing means positioned either
(a) intermediate said air inlet and said second end;
(b) intermediate said air and fuel inlets, or
(c) intermediate said fuel inlet and said outlet port,
depending on the axial position of said shaft in said chamber;

wherein said sealing means comprises fuel resistant "O" rings mounted on said shaft;

wherein said first end is sealed by a third "O" ring mounted on said shaft intermediate said first end and said outlet port;

further comprising threaded means coupling said shaft to said chamber so that a rotation of said shaft results in an axial shaft motion relative to said chamber;

wherein said shaft extends beyond both ends of said chamber, and wherein said means for limiting the axial movement of said shaft comprises a snap ring on each shaft end of greater diameter than that of said chamber;

wherein said valve shaft member further comprises a ramp portion proximate to the outlet port location;

a cam follower adapted to contact said ramp;

a generator connected to said outlet port at a first end and having an orifice at its second end;

a rod internal to said generator and attached to said cam follower at said rod's first end; and

a needle to completely fill said orifice attached to the second end of said rod, said rod being of a length so that as the shaft is axially moved the cam follower and rod, in following said ramp, will move said needle out of and into said generator orifice.

4,230,447

FLARED COMBUSTION CHAMBER

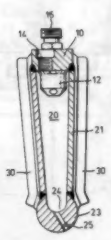
Ralph A. Boyne, Haywards Heath, and Richard L. Cottingham, Piltdown, Nr. Uckfield, both of England, assignors to Thormack Engineering Ltd., Uckfield, England

Filed Apr. 28, 1978, Ser. No. 901,231

Claims priority, application United Kingdom, Apr. 27, 1977, 17683/77

Int. Cl.³ F23R *1/04*

U.S. Cl. 431—158 **9 Claims**



1. Apparatus for producing a high velocity stream of gas, said apparatus comprising:

(a) a narrow, enclosed combustion chamber which is horizontally elongate and vertically elongate and has an upper portion and a lower surface;

(b) means defining a multiplicity of discharge orifices through said lower surface arranged in a substantially straight line;

(c) a plurality of horizontally spaced inlets for feeding a combustible gas mixture into the upper portion of the combustion chamber;

(d) means enabling the combustion mixture to be ignited within said chamber whereby, in use, combustion of the mixture takes place wholly within the chamber; and

(e) means to deflect the incoming gas mixture, so that it is distributed within the combustion chamber, and whereby the products of combustion leave the combustion chamber through the discharge orifices.

4,230,448

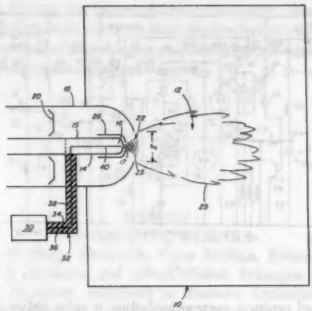
BURNER COMBUSTION IMPROVEMENTS

Michael A. V. Ward, and Fred R. Kern, both of Lexington, Mass., assignors to Combustion Electromagnetics, Inc., Lexington, Mass.

Filed May 14, 1979, Ser. No. 38,434

Int. Cl.³ F23D *11/45*; F23Q *3/00*

U.S. Cl. 431—208 **8 Claims**



1. A system for preheating fuel for use with a hydrocarbon fuel burner having a combustion chamber, electrically conductive tubular fuel carrying means for carrying fuel to said combustion chamber, said tubular fuel carrying means terminating in a nozzle, air supply means terminating at said nozzle, to create at said nozzle a fuel vapor and air mixing region, and combustion ignition means in said fuel and air mixing region for igniting said fuel vapor for combustion in said chamber, said system comprising

means for generating electromagnetic energy at microwave frequency, and

means for electrically coupling said generating means to said electrically conductive tubular fuel carrying means to create a microwave electric field within said tubular fuel carrying means to heat said fuel.

4,230,449

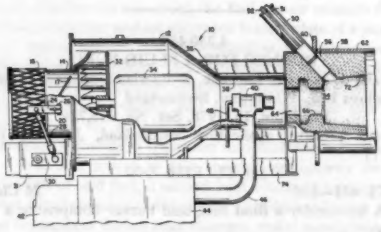
SELF CONTAINED COMPACT BURNER

Chester S. Binasik, Palo Alto; Ralph R. Vosper, San Jose, and Norman E. Harthun, San Carlos, all of Calif., assignors to Coen Company, Burlingame, Calif.

Filed Mar. 19, 1979, Ser. No. 21,740

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—353 **7 Claims**



1. A low pressure burner capable of generating a relatively long, narrow flame comprising:

a generally rotationally symmetric chamber having an opening at its upstream and an opening at its downstream end;

means for forcing air through the chamber from its upstream end to its downstream end at a pressure no greater than about 0.3 pounds per square inch above ambient pressure;

an atomizer located in said chamber downstream of the air forcing means and adapted to expel a mixture out through the downstream end of the chamber along the chamber axis so that the distribution of the mixture is not rotationally symmetric about the chamber axis;

means for supplying atomizing air to the atomizer at a pressure no greater than about 4.5 pounds per square inch above ambient pressure; and

a flame throat projecting from the downstream end of the chamber, said throat including at least two axially spaced steps to induce and control the location of eddy formation in the mixture.

4,230,450

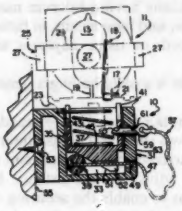
INTRUSION ALARM SAFETY

Randall H. LeFever, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 4, 1979, Ser. No. 36,126

Int. Cl.³ G08B *3/14, 7/08, 13/08*

U.S. Cl. 431—361 **9 Claims**



1. Activation means for activating at least one flashlamp unit located within a flashlamp article, said activation means comprising:

a casing adapted for having said flashlamp article positioned theron, said casing defining a chamber therein and including at least one upstanding side wall having an opening therein;

an activator movably oriented within said chamber of said casing for occupying a first, non-firing position therein, and including an aperture therein and at least one upstanding engagement member thereon, said activator effecting firing of said flashlamp unit within said flashlamp article when said article is positioned on said casing and said activator occupies said second position;

biasing means located within said casing and engaged to said activator for continuously biasing said activator toward said first, non-firing position to return said activator thereto subsequent said firing of said flashlamp unit;

engagement means movably positioned within said chamber of said casing for engaging said activator to effect movement thereof from said first, non-firing position to said second, firing position, said engagement means effecting said movement in response to external actuation thereof; and

safety means secured to said engagement means and including a retention member removably positioned within said opening within said side wall of said casing and said aperture within said activator, said retention member positively engaging said activator to retain said activator in said first, non-firing position when said retention member is positioned within said opening and said aperture, said retention member disengaging said activator upon removal of said member from said opening and said aperture to permit said activator to move to said second position in response to said external actuation thereof.

4,230,451

APPARATUS FOR THE THERMAL TREATMENT OF ORGANIC MATERIALS

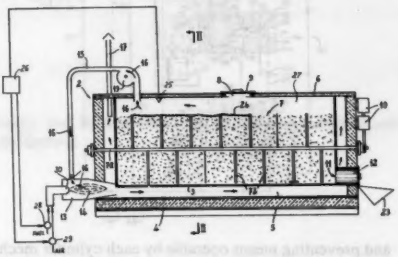
Maurice Chambe, Saint Irenee, Bessenay, Rhone, France

Filed Feb. 15, 1979, Ser. No. 12,492

Claims priority, application France, Feb. 17, 1978, 78 05465

Int. Cl.³ F23J *5/00*

U.S. Cl. 432—72 **5 Claims**



1. An apparatus for the thermal treatment of organic material comprising:

a horizontally elongated tank having a generally cylindrical bottom and formed with an inner wall of thermally conductive material spaced from an outer wall of thermally insulating material whereby the space between said walls forms a gas-flow passage;

a roof hermetically sealed to said tank and defining with said inner wall a chamber for receiving a mass of organic material, said roof being provided with a sealable opening through which said mass can be introduced into said chamber, said tank being formed along the bottom thereof with a sealable outlet for discharging the thermally treated mass;

a burner opening into said passage and sustaining flame adapted to generate hot air which traverses said passage along said inner wall to heat said mass;

a duct for feeding vapor evolved in said chamber to said burner and to supply said flame with said vapor;

a mixer in said chamber for displacing said mass along said inner wall, said mixer being rotatable about a horizontal axis; and

temperature-sensing means responsive to the temperature in said chamber for controlling same.

4,230,452

MULTIPLE DENTAL HANDPIECE CONTROL SYSTEM

George K. Austin, Jr., P. O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Division of Ser. No. 878,026, Feb. 15, 1978. This application May 4, 1979, Ser. No. 36,053

Int. Cl.³ A61C *1/02*

U.S. Cl. 433—28 **5 Claims**

1. In a multiple dental handpiece control system,

a plurality of handpieces,

a plurality of hanger mechanisms for holding the handpieces and each including valve means actuated when the handpiece associated therewith is removed from the associated hanger mechanism,

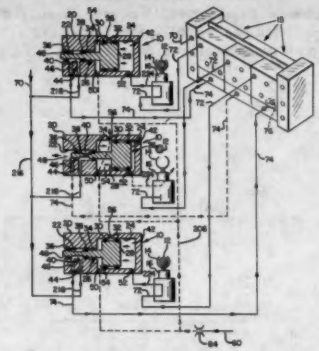
a plurality of fluid supply control units for supplying fluids to the handpieces and each including disabling means,

fluid supply means supplying fluid under pressure to the valve means,

a plurality of cylinder mechanisms operable by the valve means and each including a piston and a cylinder,

each valve means when actuated serving to actuate one of the cylinder mechanisms,

a plurality of means operable by the cylinder mechanisms for actuating the disabling means,



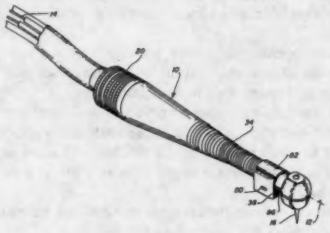
and preventing means operable by each cylinder mechanism when it is actuated for preventing actuation of the other cylinder mechanisms.

4,230,453

LIGHT ASSEMBLY FOR USE WITH A DENTAL HANDPIECE

Robert Reimers, Gardner, Kans., assignor to Litton Industrial Products Inc., Beverly Hills, Calif.

Filed Apr. 11, 1979, Ser. No. 29,236
Int. Cl.³ A61C *1/00*
U.S. Cl. 433—29 **5 Claims**



1. For use with an elongated dental handpiece having first connecting means at its proximal end for coupling the handpiece to a source of electrical power and having second connecting means generally axially spaced therefrom at its distal end for coupling the handpiece to a dental work tool and including an electrical conductor for electrically coupling the first connecting means to an exterior contact region adjacent the distal portion of the handpiece,

an improved light source assembly comprising:

an electrically insulative support member adapted to overlie the contact region of the handpiece,

a pair of electrically conductive contact members protruding from the radially inward surface of the support member which is proximate to the handpiece so as to contact the contact region thereof,

at least one bulb mounted on the radially outward surface of the support member and including first and second electrical leads,

first and second receptacle members formed within the support member to respectively freely accept the first and second leads from the bulb

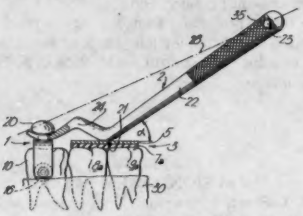
a flexible printed circuit for securely coupling the contact members to respective receptacle member without interfering with the acceptance of the leads.

4,230,454

TOOTH EXTRACTOR

Michael P. Lococo, 4927 Victoria Avenue, Niagara Falls, Ontario, Canada (L2E 1X1)

Filed Nov. 3, 1978, Ser. No. 957,142
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—153 **7 Claims**



1. A tooth extracting tool kit of the type comprising a tooth engaging grip means including a joint member for operatively associating the grip means with one end of a two arm lever means, said lever means having fulcrum means adapted to be rested on base means, said base means, in turn, being adapted to be rested on the teeth or tissue adjacent to the tooth to be extracted, wherein:

(a) said base means is a plate having a generally planar, rigid top surface;

(b) said grip means is a generally U-shaped, rigid yoke member including two sides and a base interconnecting same, two generally coaxial grip elements and adjustment means for selectively adjusting the distance between the grip elements such as to enable the securing of the yoke member to a tooth or root to be extracted said grip elements being disposed one near each free end of the respective side and having generally hemispherical, inwardly turned tips adapted to engage indentations prepared in the buccal and lingual side of the tooth or root to be extracted, respectively;

(c) said yoke member further comprises a first joint element;

(d) said two arm lever means is an uneven-arm lever whose longer arm is provided with a handle and with a cross piece protruding transversely of the free end of said handle, the shorter arm comprising a second joint element complementary with said first joint element to form with same releasable swivel joint means, the two-arm lever further comprising a fulcrum surface adapted to be rested against said rigid top surface, said fulcrum surface being offset relative to a straight line coincident with free ends of the respective arms of said lever means, whereby said lever generally resembles the shape of a check mark;

(e) said first joint element being a stem with a convexly shaped head protruding from the base of the yoke member in a direction generally opposite to that of said sides; said second joint element being a forked end of said lever, including two generally parallel prongs, the spacing between the two being slightly in excess of the diameter of said stem but considerably less than that of the convexly shaped head.

4,230,455

PROSTHETIC TEETH AND BONES

Tsuneo Hidaka; Masahide Inoue, and Masatomi Ebihara, all of Tsurugashima, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 804,476, Jun. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,233
Claims priority, application Japan, Jun. 7, 1976, 51-66217
Int. Cl.³ A61C *13/08*
U.S. Cl. 433—202 **8 Claims**

1. Prosthetic teeth and bones having superior affinity for the

living body and having a compression strength of about 4×10^3 kg/cm^2 or higher and a flexural strength of about 2.7×10^3 kg/cm^2 or higher, which comprise a composite material comprising

(a) a sufficiently fine powder having an average particle size of about 2 μm or less comprising at least 50% by weight of $Ca_{10}(PO)_4)_6(OH)_2$ and not more than about 50% by weight of at least one additive selected from the group consisting of $Ca_3(PO_4)_2$, $AlPO_4$, Al_2O_3, AlF_3, SiO_2, $Mg(PO_4)_2$, and the fluorides, chlorides and oxides of Li, Na, K, Mg and Ca, and

(b) at least one fibrous material having the coefficient of thermal expansion nearly equal to or slightly lower than that of the hydroxy-apatite selected from the group consisting of fibers, fine filaments and metal whiskers, ceramics or glass, said fibrous material being present at least 50 μm inside the surface of the prosthetic teeth and bones, and said composite material being a laminate of said fibrous material interposed between two layers of said fine

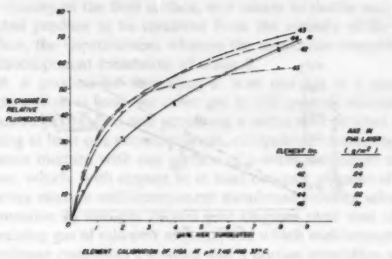
powder and having been cold compression-molded and then sintered.

4,230,456

ELEMENT AND ASSAY FOR ALBUMIN

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,122
Int. Cl.[3] G01N *33/68, 21/64*
U.S. Cl. 23—230 B 13 Claims



1. An analytical element for the detection of albumin in a liquid sample,

said element comprising a reagent zone which contains an albumin-active complex comprising a detectable species bound to a carrier;

said detectable species having a sufficiently high affinity for albumin that, when contacted with a liquid solution containing albumin, said detectable species separates from said albumin-active complex and becomes bound to albumin to form a complex comprising albumin and detectable species;

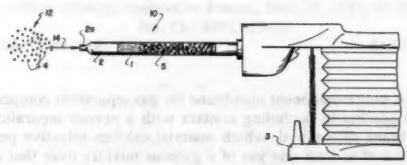
whereby albumin can be detected by (a) the presence of detectable species bound to albumin, or (b) a reduction in the amount of detectable species in said albumin-active complex.

4,230,457

APPARATUS AND METHOD FOR MEASURING AEROSOLS AND GASES WITH DETECTOR TUBES

Kurt Leichnitz, Gross Grönau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,854
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754638
Int. Cl.[2] G01N *31/22*
U.S. Cl. 23—232 R 2 Claims



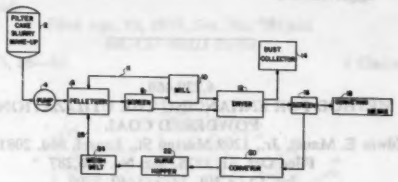
2. A method of measuring H_2SO_4 aerosols comprising, passing H_2SO_4 aerosols through a forelayer formed of a substrate impregnated with a zinc dust, arsenic trioxide and water, reacting the H_2SO_4 aerosols with the impregnated compounds to form a new gas substance, and passing the new gas substance through an indicating layer comprising a gold chloride to obtain a known indication of the presence of the new gas substance.

4,230,458

PROCESS FOR PELLETIZING WET SILICEOUS PARTICULATES

Robert B. Takewell, Borger, Tex., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 556,367, Mar. 7, 1975, Pat. No. 4,087,254, which is a continuation-in-part of Ser. No. 430,457, Jan. 3, 1974, abandoned, which is a continuation of Ser. No. 185,984, Oct. 4, 1971, abandoned. This application Apr. 26, 1978, Ser. No. 900,351
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.[3] C22B *1/24*
U.S. Cl. 23—313 AS 19 Claims



1. In a process for agglomerating finely divided siliceous particulates selected from the group consisting of clay, silica, and silicates wherein said finely divided particulates of said clay, silica, and silicates are produced in an aqueous medium and are filtered and introduced into a pelletizer to form agglomerates thereof, the improvement comprising:

(a) producing finely divided particulates of clay, silica, and silicates in an aqueous medium;

(b) filtering said aqueous medium to form a filter cake of said siliceous particulates;

(c) preparing a slurry of said filter cake of said siliceous particulates, said slurry having a solids content in the range of from about 20 to 65% by weight solids;

(d) introducing said filter cake slurry of said siliceous particulates into a pelletizer and adding dried siliceous particulates in an amount so that the solids content by weight percentage of the slurry of siliceous particulate material to be pelletized is increased to a value in the range of about 50 to 90%;

(e) pelletizing said slurry of said siliceous particulates;

(f) drying the siliceous pellets produced by pelletizing said slurry;

(g) recycling at least a portion of the dried siliceous pellets produced by pelletizing said slurry to said pelletizer to form at least a portion of the particulate siliceous materials to be added to said filter cake slurry in said pelletizer; and

(h) recovering the remainder of the siliceous pellets.

4,230,459

PROCESS FOR AGGLOMERATING PARTICULATE WOOD MATERIAL AND PRODUCTS OBTAINED THEREBY

Jean R. Moreau, 2988, La Promenade, Ste-Foy, Quebec, Canada (G1W 2J7); Martin P. Pelletier, 16, rue Pelletier, Cabano, Quebec, and Gérard B. Tremblay, 271, rue Cormier, Arvida, Quebec, both of Canada

Filed Feb. 7, 1979, Ser. No. 10,324
Claims priority, application Canada, Sep. 20, 1978, 311711
Int. Cl.[3] C10L *5/40, 5/20*
U.S. Cl. 44—10 B 23 Claims

1. Process for agglomerating particulate wood material which comprises:

(a) providing essentially particulate noncarbonized wood material having a substantially homogeneously distributed moisture content throughout and substantially heterogeneous size and shape distribution, said moisture content varying between about 10 and about 40 percent by weight calculated on a dry basis;

(b) dry mixing said particulate wood material with dry powdered lignosulfonate and forming a substantially homogeneous free-flowing mixture essentially consisting of said dry powdered lignosulfonate and said particulate wood material;

(c) compressing said mixture under a pressure of as low as about 400 lbs/inch^2 until said particulate wood material is agglomerated.

4,230,460

METHOD FOR ENHANCING THE UTILIZATION OF POWDERED COAL

Edwin E. Maust, Jr., 1209 Marton St., Laurel, Md. 20810

Filed Oct. 31, 1978, Ser. No. 956,287

Int. Cl.^{2} C10L *5/12, 5/40, 5/00*

U.S. Cl. 44—16 C **1 Claim**

1. A method for the preparation of a coal composition consisting essentially of the steps of:

(a) mixing (1) powdered coal with (2) a lime component selected from the group consisting of lime, limestone, dolomite and mixtures thereof, and (3) flyash as a pozzolonic component, to obtain substantially uniform dispersal of the lime and flyash components throughout the coal, water being added if required to obtain a mix or workable consistency;

(b) working the mix to obtain a homogeneous and uniform dispersion of the lime and flyash components with the coal particles; and

(c) forming and drying the resulting mixture into solid product shapes suitable for burning; the resulting coal composition being suitable for handling, transporting, and burning.

4,230,461

ABRASIVE WHEELS

Michael A. Sandman, Brookline, and Bernard T. Loughlin, Leicester, both of Mass., assignors to Eli Sandman Company, Worcester, Mass.

Filed Sep. 29, 1977, Ser. No. 837,823

Int. Cl.^{3} B24D *3/28, 11/02*

U.S. Cl. 51—295 **19 Claims**

17. A resin-bonded abrasive wheel comprising a reinforcing layer of a fabric coated or impregnated with a non-abrasive composition of a novolak phenolic resin essentially free of crosslinking agent and an abrasive layer comprised of abrasive material and a resinous binder.

4,230,462

METHOD OF IMPROVING TOOL LIFE OF TIC BASE TOOLS

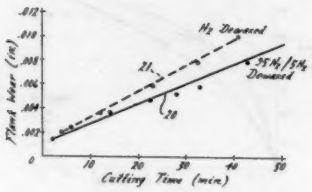
David Moskowitz, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 8, 1978, Ser. No. 967,925

Int. Cl.^{3} C04B *35/56, 35/58*

U.S. Cl. 51—307 **9 Claims**

1. A method of making cemented titanium carbide based cutting tools, wherein substantially unoxidized titanium carbide, other refractory carbides of groups 4, 5 and 6 transition metals of the periodic table, and binder metal powders are mixed and ground to sub-micron particle size in the presence of an oxidation inhibiting liquid ingredient covering the particles of said powders, the titanium carbide constituting a major proportion of the mixture, displacing said liquid ingredient with a low-boiling pressing aid, compacting the ground powder particles under ambient conditions to form a shape having some degree of porosity to permit penetration of gases into the compact, then firstly heating the shape to volatilize the pressing agent, and then secondly heating the shape in a vacuum to a higher temperature level for effecting sintering of said shape, said first heating being carried out under a flowing nitrogen based atmosphere containing 0–10% H_2.



4,230,463

MULTICOMPONENT MEMBRANES FOR GAS SEPARATIONS

Jay M. S. Henis, and Mary K. Tripodi, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 742,159, Nov. 15, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,481

Int. Cl.^{2} B01D *59/14*

U.S. Cl. 55—16 **78 Claims**

1. A multicomponent membrane for gas separation comprising a coating in occluding contact with a porous separation membrane of material, which material exhibits selective permeation of at least one gas of a gaseous mixture over that of one or more remaining gases of the gaseous mixture, said porous separation membrane having a substantial void volume, wherein, with respect to at least one pair of gases, the material of the porous separation membrane exhibits a determined intrinsic separation factor greater than the determined intrinsic separation factor of the material of said coating, and the multicomponent membrane exhibits a separation factor significantly greater than the determined intrinsic separation factor of the material of said coating and greater than the separation factor exhibited by the porous separation membrane.

47. In an apparatus for selectively separating at least one gas in a gaseous mixture from at least one remaining gas comprising an enclosure and a membrane within said enclosure for selectively separating said at least one gas in the gaseous mixture and providing a permeated product, said membrane having a feed surface and an opposing exit surface, and said enclosure having means to enable said gaseous mixture to be supplied said feed surface, means to enable removal of gases from the vicinity of the feed surface, and means to enable said permeated product to be removed from the vicinity of the exit surface, the improvement wherein the membrane comprises a multicomponent membrane of claim 1.

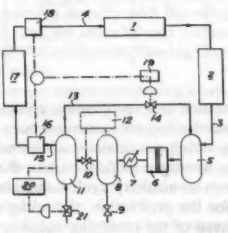
50. A process for separating at least one gas in a gaseous mixture from at least one other gas in said gaseous mixture by selective permeation and providing a permeated product containing at least one permeating gas, comprising: contacting the gaseous mixture with one surface of a multicomponent membrane, which, with respect to at least one pair of gases of said gaseous mixture multicomponent membrane exhibits selective permeation of one gas of said pair of gases over that of the remaining gas of said pair of gases, and which multicomponent membrane comprises a coating and a porous separation membrane being anisotropic having a substantial void volume and at least one relatively dense region within its thickness in barrier flow relationship to gas flow across the porous separation membrane, wherein the coating is in occluding contact with at least one relatively dense region, wherein, with respect to said pair of gases, the material of the porous separation membrane exhibits a determined intrinsic separation factor greater than the determined intrinsic separation factor of the material of said coating, and the multicomponent membrane exhibits a separation factor significantly greater than the determined intrinsic separation factor of the material of the coating and greater than the separation factor exhibited by the porous separation membrane; maintaining the opposite surface of the multicomponent membrane at a lower chemical potential for said at least one permeating gas than the chemical potential at the said surface; permeating said at least one permeating gas into and through the multicomponent membrane; and removing from the vicinity of said opposite surface a permeated product having a different proportion of said at least one gas of said gaseous mixture to said at least one other gas of said gaseous mixture than the proportion in the gaseous mixture of said at least one gas to said at least one other gas.

4,230,464

METHOD FOR RECYCLING A CARRIER GAS FROM THE TRAPPING SYSTEM TO THE INLET OF A GAS CHROMATOGRAPHIC SEPARATION UNIT

Reynald Bonmati, New York, N.Y.; Bernard Roz, Brii sous Forges, and Henri Tollet de Santerre, Lyons, both of France, assignors to Societe Nationale Elf Aquitaine, Paris and Societe de Recherches Techniques et Industrielles, Buc, both of, France

Filed Dec. 13, 1978, Ser. No. 969,278
Claims priority, application France, Dec. 20, 1977, 77 38393
Int. Cl.² B01D *15/08*
U.S. Cl. 55—23 **14 Claims**



1. A method for recycling a carrier gas flowing from a gas chromatographic separation unit having an inlet and comprising a trapping system having an outlet which comprises:

withdrawing the carrier gas from said trapping system,

subjecting said carrier gas to a pre-purification step, then to a purification step,

recycling gas purified in said purification step at the inlet of said chromatographic separation unit, and

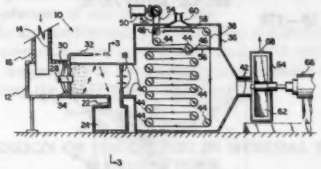
maintaining the flow rate and pressure of said carrier gas at strictly constant values at the inlet of said chromatographic unit.

4,230,465

POLLUTION CONTROL APPARATUS AND METHOD

Mrs. Edward Hope, 117 Northview Ave., Whitby, Ontario, Canada

Filed Apr. 11, 1977, Ser. No. 786,631
Int. Cl.² B01D *50/00*
U.S. Cl. 55—83 **6 Claims**



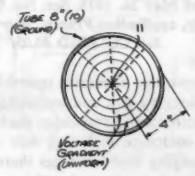
1. A method for removing particulate matter from a gas having a temperature of up to about 3000° F. comprising passing said gas through centrifugal separation means for centrifugally removing particulate matter therefrom, cooling said gas when said particulate matter is being removed therefrom to a temperature less than about 400° F. by mixing with a stream of a refrigerated fluid having a temperature from about −50° F. to about −400° F. and simultaneously forcing particulate matter from said gas to the inner peripheral walls of said centrifugal separation means to remove particulate matter from said gas.

4,230,466

DISCHARGE ELECTRODE STRUCTURE FOR ELECTROSTATIC PRECIPITATOR

Thomas J. Michel, Hialeah, Fla., assignor to Santek, Inc., Hollywood, Fla.

Filed May 10, 1979, Ser. No. 37,533
Int. Cl.² B03C *3/41*
U.S. Cl. 55—147 **8 Claims**



1. An electrostatic precipitator for extracting particles and other contaminants from a gaseous stream, said precipitator comprising:

A a collector electrode tube;

B a discharge electrode structure disposed in said tube, said structure including a column whose center axis is coincident with the axis of the tube, said column being formed of dielectric material and having a cross-sectional geometry that defines a circular series of longitudinally-extending niches, and a circular array of fine gauge wires supported between the ends of the column, each wire being sus-

pended within a respective niche, whereby the wires are electrostatically isolated from each other; and

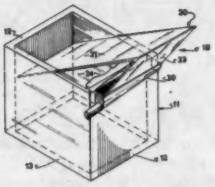
C means to impress a high voltage between the array of wires and the facing surface of the collector tube to create an electrostatic field in the annular region between the discharge electrode and the tube to ionize the contaminants in the gaseous stream passing therethrough, the surfaces of the niches acquiring bound electrostatic charges whereby the voltage gradient established between the discharge electrode structure and the tube is substantially uniform.

4,230,467

APPARATUS FOR REMOVING FOAM

Hubert W. Buchwald, Birmingham, Ala., and Peter C. Houle, Richmond, Va., assignors to TII Corporation, Lindenhurst, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,304
Int. Cl.[2] B01D *19/02*
U.S. Cl. 55—178 **16 Claims**



1. A foam removal apparatus for a vessel containing liquid and foam bubbles, comprising:

a cover for the vessel, said cover inclined with respect to the horizontal and partially extending downwardly into said vessel;

said cover having an end wall;

said cover having side support walls, said side support walls residing upon said vessel; a screen having apertures; and

a trough, said trough located beneath at least a portion of said screen for removing foam passing through said screen.

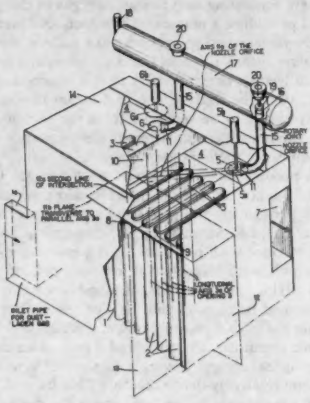
4,230,468

DUST SEPARATOR WITH DECLOGGING DEVICE

Albert Rebours, Chatou, and Jean-Pierre Guibet, Vernon, both of France, assignors to Air Industrie, Courbevoie, France

Filed May 24, 1978, Ser. No. 908,928
Claims priority, application France, May 26, 1977, 77 16149
Int. Cl.[3] B01D *46/04*
U.S. Cl. 55—294 **6 Claims**

1. In a dust separator apparatus operable with a source of compressed declogging gas, and including an inlet enclosure with means for introducing dust-laden gas into said inlet enclosure, an outlet enclosure including side walls thereof with means for discharging dust-freed gas therefrom, a separating wall for separating said inlet and outlet enclosures from each other, and a plurality of elongated filter elements disposed in the inlet enclosure, these elements having central longitudinal axes respectively in parallel relationship, each filter element having one end thereof traversing said separating wall with an opening in said end of each filter element communicating into said outlet enclosure, the apparatus further comprising duct means for selectively introducing compressed gas from said source thereof into said outlet enclosure to flow into said filter elements in counter-flow relative to the flow of dust-freed gas therethrough, said duct means comprising at least one nozzle having a discharge end terminating as an orifice with a discharge axis thereof directed essentially transversely to said parallel axes of said filter elements and across said open ends thereof and directed obliquely to at least one of said side walls



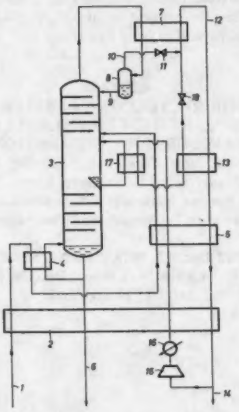
of said outlet enclosure in the vicinity of said open ends of said filter elements.

4,230,469

DISTILLATION OF METHANE FROM A METHANE-CONTAINING CRUDE GAS

Peter Grimm, Pullach, and Peter Burr, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,752
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734080
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—28 **6 Claims**



1. In a separation in a rectification column of methane and optionally lower-boiling components from a methane-containing crude gas, which gas contains additionally higher-boiling hydrocarbons, hydrogen sulfide, carbon dioxide, or mixtures thereof, wherein an auxiliary cycle containing a fluid medium is employed for the production of cooling to produce reflux liquid at the head of the rectifying column, the improvement wherein liquid in the rectifying column located in the region of plates numbers 0.4 x–0.6 x, wherein x is the number of theoreti-

cal plates in the column, is vaporized in indirect heat exchange with condensing auxiliary cycle medium, without said condensing auxiliary cycle medium reboiling the bottoms, and reboiling the bottoms with feed to the rectification column without indirect heat exchange in said region of plates.

4,230,470

AIR CONDITIONING SYSTEM

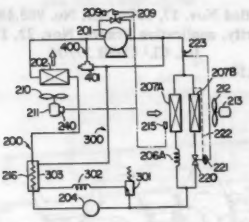
Toshiharu Matsuda, Kudamatsu; Seigo Miyamoto, Takahagi, and Yasuo Minoshima, Yamaguchi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,821

Claims priority, application Japan, Jan. 21, 1977, 52/4970; Apr. 15, 1977, 52/46522; Jul. 25, 1977, 52/88378

Int. Cl.² F25B *41/00*

U.S. Cl. 62—197 **12 Claims**



1. An air conditioning system comprising:

a compressor;

means for condensing a refrigerant through heat exchange with outdoor air;

first pressure reducing means;

means for evaporating the refrigerant through heat exchange with air to be conditioned;

piping means fluid connecting said compressor, said means for condensing, said first pressure reducing means and said means for evaporating serially together to form a closed main circuit for the refrigerant; and

a bypass circuit means connecting a high pressure section of said main circuit extending from said means for condensing to said first pressure reducing means to a low pressure section of said main circuit extending from said means for evaporating to said compressor;

said bypass circuit means comprising

means for controlling the flow of the refrigerant,

second pressure reducing means,

heat exchanger means for causing heat exchange to take place between a portion of the refrigerant flowing through the high pressure section of said main circuit extending from the compressor to the first pressure reducing means and a portion of the refrigerant flowing through the bypass circuit means having had its pressure reduced at said second pressure reducing means, and said heat exchanger means including a solid heat exchange wall having opposed surfaces, one of said surfaces contacting directly with the refrigerant in said main circuit, and the other of said surfaces contacting directly with the refrigerant flowing through said bypass circuit means,

said heat exchanger means comprising a tube in tube type heat exchanger including an outer tube, and an inner tube defining a first passage therein and arranged in said outer tube to define a second passage therebetween, and one of said first and second passages being disposed in said main circuit downstream of said means for condensing and the other of said first and second passages being disposed in said bypass circuit means downstream of said second pressure reducing means so that heat exchange between refrigerants passing through the first and second passages is effected through the inner tube constituting said heat exchanger wall;

said compressor including means for effecting compression capacity control;

said means for condensing including a condenser, and a fan and a variable speed motor associated with said condenser;

said means for evaporating including a pair of evaporators arranged in parallel with each other;

said first pressure reducing means including pressure reducing means mounted upstream of one of said pair of evaporators, and an expansion valve of the maximum operating pressure type, said expansion valve being responsive to the evaporative pressure of the evaporator connected thereto;

a thermal bulb for detecting the temperature of refrigerant at a point downstream of the junction of two streams of refrigerant released from the two evaporators and producing a correlated internal pressure;

said expansion valve further being responsive to the internal pressure of said thermal bulb;

and the air conditioning system further comprises means for controlling said compression capacity in response to the temperature in a room, and control means for controlling the speed of said motor.

4,230,471

SUPPRESSION OF POLLUTION IN MINERAL FIBER MANUFACTURE

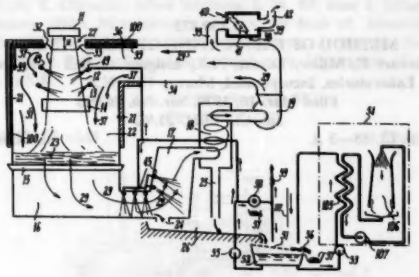
Marcel Levecque, Birchrunville, Pa., and Jean A. Battigelli, Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 747,433, Dec. 3, 1976, Pat. No. 4,105,424, which is a continuation-in-part of Ser. No. 456,878, Apr. 1, 1974, abandoned, and No. 557,281, Mar. 11, 1975, Pat. No. 4,052,183, which is a continuation-in-part of Ser. No. 353,983, Apr. 24, 1973, Pat. No. 3,874,886. This application Jul. 10, 1978, Ser. No. 923,151

Claims priority, application France, Mar. 30, 1973, 73 11525; Oct. 10, 1973, 73.36169; Feb. 10, 1975, 75 04039; Oct. 22, 1976, 76 31860

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **3 Claims**



3. Apparatus for forming fibrous mats from thermoplastic mineral material comprising a chamber having a perforated fiber collecting conveyor at the bottom, gas blast fiber attenuation means in the region of the top of the chamber arranged to direct a fiber-laden gaseous current in a path in the chamber extended downwardly toward the fiber collecting conveyor, suction means below the conveyor for drawing gases through the conveyor and thereby building up a mat of fibers on the conveyor, gas circulating ducting receiving the gases from the suction means, the ducting being arranged to deliver the circulating gases laterally into the chamber in a region in said path

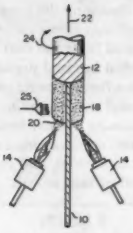
directed transversely toward the downwardly directed fiber-laden gaseous current, and a tubular shield surrounding the downwardly directed current in said region of the transversely directed path of the recirculating gases.

4,230,472

METHOD OF FORMING A SUBSTANTIALLY CONTINUOUS OPTICAL WAVEGUIDE

Peter C. Schultz, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1979, Ser. No. 13,922
Int. Cl.³ C03B *37/00*; C03C *25/02*
U.S. Cl. 65—3 A **25 Claims**



1. A substantially continuous method of forming an optical waveguide blank comprising the steps of

providing a substantially longitudinally continuous core member,

providing a longitudinal starting member having at least one end surface suitable for affixing said core member thereto,

affixing one end of said core member to said one end of said starting member,

applying particulate material to the exterior surface of the core member to form an adherent coating having an index of refraction less than that of said core member, and

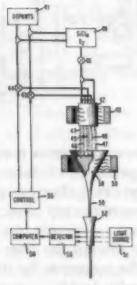
longitudinally translating said starting member and said core member while simultaneously applying said adherent coating of said particulate material to said core member to form a continuous and substantially homogeneous adherent coating of substantially uniform thickness.

4,230,473

METHOD OF FABRICATING OPTICAL FIBERS

Stewart E. Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1979, Ser. No. 20,995
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3 A **6 Claims**



1. A method of fabricating an optical fiber comprising the steps of:

forming (11) particulate precursor material capable of being consolidated into a glass (16);

directing a stream (14) of said particulate material onto a supporting member (10) where it is consolidated by heating (13) to form a stub preform;

CHARACTERIZED IN THAT:

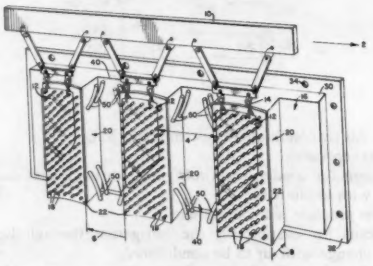
said fiber (17) is continuously drawn from one end of said stub (18) as long as said particulate material continues to be deposited upon the opposite end of said stub.

4,230,474

APPARATUS AND PROCESS FOR SIMULTANEOUS THERMIC GLASS SHEET HARDENING

Mario Roth, Aachen; Johann Winandy, Herzogenrath, and Hans-Pieter Siemonsen, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 17, 1978, Ser. No. 963,436
Claims priority, application France, Nov. 22, 1977, 77 34987
Int. Cl.³ C03B *27/04*
U.S. Cl. 65—114 **9 Claims**



1. An improved apparatus for simultaneous thermic hardening via rapid air cooling of a plurality of closely, vertically suspended glass sheets in a neutral position on a conveyor spaced generally along the direction of transport is characterized by an improvement comprising:

a. a pair of compressed air caissons:

i. positioned diametrically opposite each other,

ii. having a plurality of compressed air pipes, and

iii. dimensioned and configured whereby the caissons are divided into a plurality of elementary caissons; and

b. the elementary caissons being:

i. equivalent in number to the glass sheets to be simultaneously hardened and being spaced along the direction of transport,

ii. dimensioned and configured such that the elementary compressed air caisson surface area does not appreciably extend beyond that area necessary for the hardening of the glass sheet,

iii. joined to a common wind box, and

iv. separated by evacuation channels of a sufficient dimension and configuration wherein the compressed air flow emitted via the front wall of each elementary caisson is unobstructed by the evacuation channels so as to avoid compressed air accumulation zones.

8. A process for the simultaneous hardening by a compressed air flow of a plurality of adjacently suspended glass sheets on a common conveyor is characterized by:

a. suspending the glass sheets at spaced intervals generally along the direction of transport;

b. subjecting the glass sheets to a compressed air flow being of a surface area which does not appreciably extend beyond that area necessary for the hardening of each glass sheet;

c. discharging the compressed air flow into evacuation channels disposed generally between the spaced intervals at a

flow sufficient to substantially prevent compressed air accumulation zones, the compressed air flow between unobstructed by the evacuation channels; and

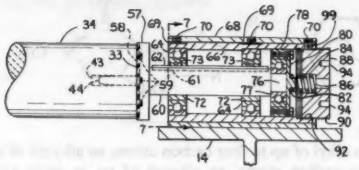
d. moving the conveyor a multiple of the interval spacing.

4,230,475

CERAMIC ROLL DRIVE AND SUPPORT MECHANISM AND A METHOD OF USING SAME

Ronald G. Dunk, Hepworth, Canada, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 5, 1979, Ser. No. 17,213
Claims priority, application Canada, Feb. 20, 1979, 321883
Int. Cl.[2] C03B *25/04*
U.S. Cl. 65—118 **10 Claims**



1. Apparatus for transporting a glass sheet along a path of travel through an enclosed, heated, tunnel-like furnace comprising a rotatable conveyor roll extending transversely of said path of travel for rotation about an axis extending transversely of said path, said conveyor roll comprising a ceramic roll of cylindrical configuration, an elongated recess extending longitudinally inward from each end of said ceramic roll in axial alignment therewith, a rotatable metal spindle axially aligned with each end of said ceramic roll, an alignment pin extending axially inward from each said spindle into one or the other of said recesses and axially aligned with said associated spindle and recess, one of said spindles having an outer axial end, drive means drivingly connected to said outer axial end of said one spindle to rotate the latter, means abutting the axial outer end of the other spindle to apply a yieldable compressive force fin the axial direction of said ceramic roll, said ceramic roll having a pair of end surfaces extending transverse to said axial direction, a coating of friction material applied to each of said end surfaces, a head approximately coextensive in cross section with said end surfaces at the axially inner end of each said spindle, a recessed surface facing axially inwardly of each said head, and a coating of friction material applied to each of said recessed surfaces to interface said end surfaces of said ceramic roll and said recessed surfaces of said heads with friction material, whereby said ceramic roll rotates in unison with said spindles in axial compression therebetween when said drive means rotates said one spindle.

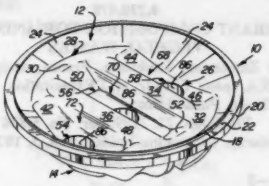
8. A method of conveying a series of glass sheets along a path of travel through a tunnel-like furnace comprising; supporting each glass sheet on the common upper tangential plane of a series of parallel, horizontally spaced, cylindrical, ceramic rolls; propelling the glass sheet along the ceramic rolls by imparting rotation to each ceramic roll about its cylindrical axis by way of a first metallic spindle engaging an end of the ceramic roll; maintaining each ceramic roll in axial compression by applying a yieldable compressive force to the ceramic roll by way of a second spindle engaging the opposite end of the ceramic roll; and maintaining the spindles in frictional engagement with the ceramic rolls by interposing friction material between an end surface at each end of each ceramic roll transverse to the axis of the roll and a parallel, adjacent surface on the respective spindle.

4,230,476

APPARATUS AND METHOD FOR OBTAINING UNIFORM GOBS IN A TRIPLE GOB FEEDER

Peter Vischer, Golden, Colo., assignor to Coors Container Company, Golden, Colo.

Filed Apr. 2, 1979, Ser. No. 26,099
Int. Cl.[3] C03B *7/08*
U.S. Cl. 65—128 **17 Claims**



15. A method of obtaining uniform gob size in a triple gob feeder comprising an orifice ring having two end reservoirs and a middle reservoir for receiving and temporarily storing molten glass and an orifice associated with each reservoir permitting flow of molten glass through the orifice ring, comprising:

supplying molten glass to two end reservoirs and to a middle reservoir in an orifice ring;

maintaining the average residence time of molten glass in the two end reservoirs at a relatively constant level;

maintaining the average residence time of molten glass in the middle reservoir at a relatively constant level which is longer than the average residence time of molten glass in the two end reservoirs by forming the middle reservoir at a volumetric size relatively larger than that of each of the end reservoirs, and then

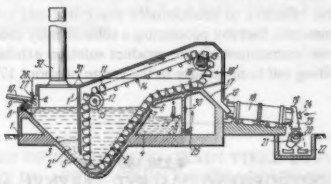
urging a regulated portion of the molten glass in each reservoir through an orifice associated with each reservoir at a regulated rate.

4,230,477

APPARATUS FOR GRANULATING MOLTEN SLAG

Mikhail A. Sharonov, ulitsa Tekhnologicheskaya, 3, kv. 19; Lik A. Zainullin, ulitsa Lenina, 101, kv. 54, both of Sverdlovsk; Felix Y. Olginsky, ulitsa Bazhova, 1, kv. 87; Ivan I. Scherbakov, ulitsa Malakhitovaya, 9, kv. 30 both of, Moscow; Serafim V. Kolpakov, ulitsa Ryazanskaya, 3, Lipetsk, and Leonid I. Teder, ulitsa admirala Makarova, 17, Lipetsk, all of U.S.S.R.

Filed Jan. 2, 1979, Ser. No. 333
Int. Cl.[2] C03B *5/22*
U.S. Cl. 65—141 **4 Claims**



1. An apparatus for granulating molten slag comprising a device for breaking up said molten slag by water, a divided settling bin including inclined walls for holding granulated slag and water connected to said device, a sloped elevator with perforated buckets mounted in said settling bin, at least along one of said inclined walls, for discharging therefrom said granulated slag, pulleys and pulley shafts for said sloped elevator disposed above the level of water in said settling bin, one of

said pulleys, being placed above the other one, in the direction of the elevator movement, and a device for drying said granulated slag disposed at the place of discharge of said granulated slag from said settling bin; whereby the reliability of operation is enhanced due to the location of said pulleys and pulley shafts above the level of water in said settling bin.

4,230,478

DEODORANT COMPOSITION FOR ANIMAL AND VEGETAL WASTES

Jean-Pierre Zumbrunn, Eaubonne, France, assignor to L'Air Liquide S.A. pour l'Etude et l'Exploitation des Procedes George Claude, Paris, France

Filed Jan. 23, 1979, Ser. No. 5,836
Claims priority, application France, Feb. 3, 1978, 78 03000
Int. Cl.³ C05F *3/00*
U.S. Cl. 71—3 **7 Claims**

1. A deodorizing composition consisting essentially of an aqueous mixture of an oxygen generating compound, an odor masking agent, and an emulsifying effective amount of a biodegradable emulsifying surfactant, wherein the oxygen generating compound is hydrogen peroxide at a concentration expressed at 100% H_2O_2 of 50 to 500 g/liter of said aqueous mixture, the odor masking agent is a pine oil or the sesquiterpenes of turpentine, present in a concentration of 50 to 400 ml/l of said aqueous mixture, and the emulsifying surfactant concentration is 5 to 50 g/l of said aqueous mixture.

4,230,479

PROCESS FOR IMPROVING THE QUALITY OF UREA-AMMONIUM NITRATE SOLUTION

Robert C. Richardson, Beatrice, Nebr., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1979, Ser. No. 25,509
Int. Cl.² C05C *9/00, 1/00*
U.S. Cl. 71—30 **9 Claims**

1. A process for producing high nitrogen urea/ammonium nitrate solutions exhibiting low salting out temperatures which comprises

admixing a hot urea-containing solution and a hot ammonium nitrate containing solution, at least one of which containing free residual ammonia, said admixing resulting in a hot residual free ammonia containing urea/ammonium nitrate solution containing free residual ammonia in amounts undesirable in fertilizer applications,

cooling said hot residual free ammonia-containing urea/ammonium nitrate solution below about 190° F. and above about 140° F., and

contacting said cooled free ammonia-containing urea/ammonium nitrate solution with an amount of aqueous nitric acid effective to substantially neutralize said residual free ammonia, thereby producing a substantially ammonia free urea/ammonium nitrate product solution exhibiting a low salting out temperature in the range of about 17° F. to 19° F.

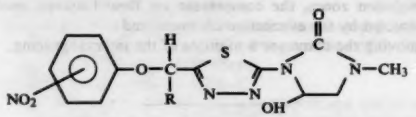
4,230,480

3-[5-(1-(NITROPHENOXY)ALKYL, ALKYNYL, ALKENYL, OR HALOALKYL)-1,3,4-THIADIAZOL-2-yl]-4-HYDROXY-1-METHYL-2-IMIDAZOLIDINONES

Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1979, Ser. No. 49,018
Int. Cl.² A01N *9/22*; C07D *417/04*
U.S. Cl. 71—90 **36 Claims**

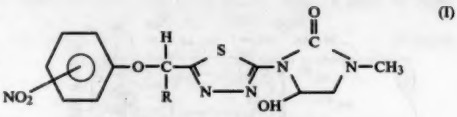
1. A compound graphically represented by Formula I:



wherein:

R is an alkyl of up to four carbon atoms,
an alkenyl of up to three carbon atoms,
an alkynyl of up to three carbon atoms, or
a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

17. A method of controlling weeds, which comprises contacting the weeds with a herbicidally effective amount of a compound graphically represented by Formula I:



(I)

wherein:

R is an alkyl of up to four carbon atoms, an alkynyl of up to three carbon atoms, an alkenyl of up to three carbon atoms, or a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

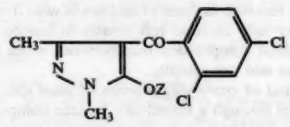
4,230,481

PYRAZOLE DERIVATIVES USEFUL AS A HERBICIDAL COMPONENT

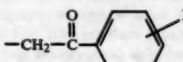
Ryuzo Nishiyama, Takatsuki; Fumio Kimura, Kusatsu; Takahiro Haga, Kusatsu; Nobuyuki Sakashita, Kusatsu, and Tetsuji Nishikawa, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Limited, Osaka, Japan

Filed Jul. 31, 1978, Ser. No. 929,564
Claims priority, application Japan, Aug. 12, 1977, 52-96110; Nov. 10, 1977, 52-134072
Int. Cl.³ A01N *43/56*; C07D *231/10*
U.S. Cl. 71—92 **12 Claims**

1. A pyrazole derivative having the formula:

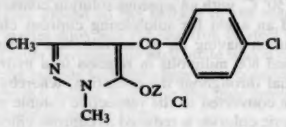


wherein Z is

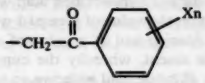


group (wherein X is a (C_1–C_4) alkyl group or a (C_1–C_4) alkylthio group, and n is 0, 1 or 2).

7. A herbicidal composition comprising a herbicidally effective amount of at least one compound having the formula:



where in Z is



group (wherein X is a (C_1–C_4) alkyl group or a (C_1–C_4) alkylthio group, and n is 0, 1 or 2) as an active ingredient, and an agricultually acceptable adjuvant.

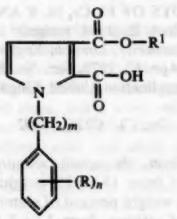
4,230,482

HERBICIDE ANTIDOTES

Larry W. Peterson, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 937,615, Aug. 28, 1978, abandoned. This application May 21, 1979, Ser. No. 41,288
Int. Cl.³ A01N *25/32, 43/70, 43/36*
U.S. Cl. 71—93 5 Claims

1. A method for increasing the safety of the herbicide, cyanazine, with respect to a grain sorghum plant, which comprises providing the growing sorghum plant, at the time it is contacted with the herbicide, with an effective amount of an antidote compound of the formula:



wherein m, n, R and R^1 are as follows:

Compound No.	m	n	R	R^1
1	0	0	—	H
2	1	0	—	H
3	0	1	3-(—CF_3)	H
4	0	1	2-(—F)	H
5	0	1	3-(—Cl)	H
6	0	0	—	—CH_3
7	0	1	2-(—Cl)	H
8	1	1	3-(—Cl)	H
9	0	2	2-(Cl),5-(—Cl)	H

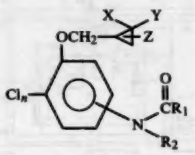
4,230,483

SUBSTITUTED CYCLOPROPYLMETHOXY PHENYL CARBAMATES AND THIOCARBAMATES AND THEIR USE AS HERBICIDES

Raymond A. Felix, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 807,940, Jun. 21, 1977, Pat. No. 4,149,874. This application Feb. 21, 1979, Ser. No. 13,359
Int. Cl.³ A01N *37/26, 37/44;* C07C *155/03, 125/06*
U.S. Cl. 71—100 30 Claims

1. A compound having the formula



in which R_1 is lower alkoxy or thio-lower alkyl R_2 is hydrogen, lower alkoxy-alkyl or lower alkanoyl; X and Y are independently chloro, fluoro or bromo; Z is hydrogen, methyl, dimethyl or one methyl and one chloro and substituent; and n is 0 or 1.

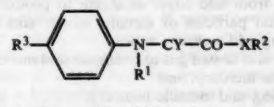
4,230,484

CONTROL OF POLLEN FORMATION

Jeremy J. Batch, Sunninghill; Keith P. Parry, Maidenhead; Colin F. Rowe, Slough; David K. Lawrence, Reading, all of England, and Michael J. Brown, Randolph Township, Morris County, N.J., assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 25, 1978, Ser. No. 900,007
Claims priority, application United Kingdom, May 5, 1977, 18862/77
Int. Cl.³ A01N *37/44*
U.S. Cl. 71—111 1 Claim

1. A method of controlling pollen formation in hermaphrodite plants, the method consisting essentially of the step of applying to the plant at or around the time of meiosis in the plant a pollen controlling amount of a compound of formula:



wherein R^1 is hydrogen, X and Y are both oxygen, R^2 is ethyl and R^3 is trifluoromethyl.

4,230,485

METHOD OF INCREASING GRAIN YIELD IN FIELD CORN BY APPLICATION OF TRIACONTANOL

Alvin J. Ohlrogge, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

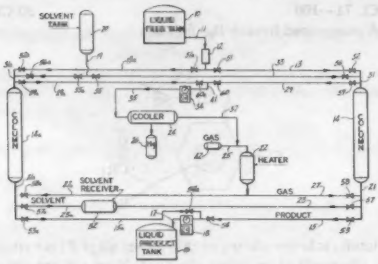
Filed Nov. 14, 1978, Ser. No. 960,762
Int. Cl.³ A01N *31/02*
U.S. Cl. 71—122 7 Claims

1. The method of enhancing the grain yield of a field corn crop by applying triacontanol to the foliage of a corn plant at a rate of less than 112 mg per acre and at a growth stage of the corn plant after tassel initiation inside the corn plant.

4,230,486
PROCESS FOR REMOVAL AND RECOVERY OF MERCURY FROM LIQUIDS

Italo A. Capuano, and Patricia A. Turley, both of Orange, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 28, 1978, Ser. No. 901,175
Int. Cl.[2] C22B *43/00*
U.S. Cl. 75—81 **27 Claims**



1. A process for the recovery of metallic mercury from a mercury-containing liquid having a pH of about 5 or higher to produce a purified liquid having a mercury content of less than 50 parts per billion which comprises:

(a) contacting particles of metallic silver with said liquid to dissolve said mercury in said metallic silver to form a silver amalgam and a purified liquid,

(b) separating said purified liquid from said silver amalgam,

(c) heating said silver amalgam with a heated gas to vaporize mercury from said silver amalgam to produce mercury vapors and particles of metallic silver, said heated gas containing said mercury vapors,

(d) cooling said heated gas to condense said mercury vapors to metallic mercury, and

(e) recovering said metallic mercury.

18. A process for the recovery of metallic mercury from a solution of an alkali metal alkoxide to produce a purified solution having a mercury content of less than 50 parts per billion which comprises:

(a) contacting particles of metallic silver contained in a separation unit with said liquid to dissolve said mercury in said silver to form a silver amalgam and a purified solution of an alkali metal alkoxide,

(b) separating said purified solution from said silver amalgam,

(c) heating said silver amalgam with a heated gas to vaporize mercury from said silver amalgam to produce mercury vapors and particles of metallic silver, said heated gas containing said mercury vapors,

(d) cooling said heated gas to condense said mercury vapors to metallic mercury, and

(e) recovering said metallic mercury.

4,230,487
METHOD OF SELECTIVELY BRINGING INTO SOLUTION THE NON-FERROUS METALS CONTAINED IN SULPHURIZED ORES AND CONCENTRATES

Jean-Michel Demarthe, Viroflay; Louis Gandon, and Andre Georgeaux, both of Rambouillet, all of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Continuation of Ser. No. 794,107, May 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 577,772, May 15, 1975, abandoned. This application Sep. 7, 1979, Ser. No. 73,438
Claims priority, application France, May 15, 1974, 74 16773
Int. Cl.[2] C22B *13/04, 15/08, 19/22, 23/04*
U.S. Cl. 75—101 R **19 Claims**

1. A method for selectively solubilizing at least one non-ferrous metal selected from the group consisting of lead, zinc, copper, silver, cadmium, nickel, and cobalt, and contained, in the form of its sulphide, in an initial product selected from the group consisting of sulphurized ores and concentrates, comprising subjecting said initial product to lixiviation at a temperature above 50° C. with an aqueous solution containing cupric chloride and an agent for solubilizing cuprous chloride, the aqueous solution having an oxido-reduction potential of between 400 and 800 millivolts in relation to a hydrogen electrode potential throughout the operation, whereby the metal sulphides are converted to the respective soluble metal chlorides, the cupric chloride is reduced to cuprous chloride which remains in solution due to said solubilizing agent, and elemental sulfur is produced, and regenerating the resulting reaction mixture in situ at atmospheric pressure and at a temperature above 50° C. with air and hydrochloric acid while maintaining the pH of the solution at a value of at most 1 when the solution contains ferrous chloride and at a value of at most 3 when ferrous chloride is absent, whereby the cuprous chloride is oxidized to cupric chloride, and isolating an aqueous solution containing said at least one non-ferrous metal chloride.

4,230,488
ABRASION RESISTANT RAILS AND/OR RAIL WHEELS, AND PROCESS FOR PRODUCING THE SAME

Wilhelm Heller, Duisburg; Walter Knoor, Bochum, and Reinhard Schweitzer, Düsseldorf, all of Fed. Rep. of Germany, assignors to Fried. Krupp Hüttenwerke AG, Bochum, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 920,818
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730045
Int. Cl.[2] C22G *38/60*
U.S. Cl. 75—123 F **12 Claims**

1. In a unit composed of a railway rail and a railway wheel adapted to travel thereover, said rail and said wheel being formed from a steel for railways comprising in percent by weight no more than 0.80% carbon, no more than 1.50% silicon, no more than 3.50% manganese, no more than 4.00% chromium; with the total contents of manganese and chromium together not exceeding 4.50% and the remainder iron and other alloying elements used in steels for railway rails and railway wheels, the improvement comprising:

adding an alloying material selected from the group consisting of lead and bismuth in an amount in the range of 0.02 percent to 0.35 percent by weight to the steel used for the railway rail or the railway wheel.

4,230,489
ALLOYS OF Fl, Cr, Si, Y AND Al

John E. Antill, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 13, 1979, Ser. No. 29,841
Claims priority, application United Kingdom, Apr. 28, 1978, 17063/78
Int. Cl.[3] C22C *39/02*
U.S. Cl. 75—124 **1 Claim**

1. An alloy of iron, chromium, aluminium, yttrium and silicon consisting of from 15 to 25 weight percent of chromium, from 4 to 5.5 weight percent of aluminium, from 0.01 to 3 weight percent of yttrium, from 1 to 2 weight percent of silicon, and the balance iron.

4,230,490
PROCESS FOR PRODUCING CAST IRON

Werner Kessl, Nr. 10a, 8481 Bärnwinkel, Fed. Rep. of Germany

Filed May 16, 1978, Ser. No. 906,763
Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723870
Int. Cl.[2] C21C *33/08*
U.S. Cl. 75—130 B **9 Claims**

1. A process for producing cast iron containing globular graphite comprising covering magnesium or a magnesium master-alloy with a material to prevent oxidation of the magnesium or magnesium master-alloy, said material being particu-

late silicon carbide and a material selected from the group consisting of iron and steel chips, the particulate silicon carbide forming a layer closest to the surface of the magnesium or magnesium master-alloy and the said iron or steel chips forming a second layer covering the particulate silicon carbide such that the silicon carbide and said chips form consecutive layers and then pouring molten iron onto the thus covered magnesium or magnesium master-alloy.

4,230,491

INTERNAL COMBUSTION ENGINE TAPPET COMPRISING A SINTERED POWDERED METAL WEAR RESISTANT COMPOSITION

Robert C. Behnke, Wheaton, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 820,723, Aug. 1, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,910

Int. Cl.[2] **C22C** *38/12, 38/14, 38/18;* **F01L** *1/14*

U.S. Cl. 75—243 **5 Claims**

1. An internal combustion engine tappet comprising a sintered powdered metal heat treated wear resistant composition having a matrix formed from iron powder, carbon in the range of 0.50–1.0% by weight, and a ferroalloy powder with a mesh size of +50–325 acting as a nucleus for diffusion of the alloying metal into the surrounding iron particles, the alloying metal in the composition being in the range of 1–10% by weight and being selected from the group consisting of chromium, titanium, boron, vanadium, columbium, molybdenum, tantalum and tungsten, the iron, carbon and ferroalloy being briquetted at a pressure of 40–60 tons/sq.in. and sintered, in solid phase, at a temperature of 2000°–2100° F. in a reducing atmosphere including the combination of carbon monoxide and hydrogen in the range of 55–80%, the resulting product being heterogeneous and having hard ferroalloy nuclei and interconnected porosity with a density at the wear surface of approximately 6.8–7.0 gm/cc.

4,230,492

ARYL SULFONIC ACID BASED STABILIZERS FOR PRESENSITIZED PLANOGRAPHIC PLATES

Daniel C. Thomas, Wheaton, Ill., assignor to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 676,296, Apr. 12, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,196

Int. Cl.[2] **G03C** *1/60, 1/94;* **G03F** *7/08*

U.S. Cl. 430—159 **4 Claims**

1. A presensitized lithographic plate consisting essentially of an anodized aluminum plate base, a hydrophilic and olephobic silicate sub-base coating on said plate base, a sensitizer coating overlying said sub-base coating comprising a water soluble photosensitive diazo resin, and a water soluble aryl sulfonic acid based stabilizer selected from the group consisting of p-chlorobenzene sulfonic acid, and alkali metal salts thereof, said stabilizer being interposed as a separate layer between said sub-base coating and said sensitizer coating.

4,230,493

GOLD CONDUCTOR COMPOSITIONS

John J. Felten, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1978, Ser. No. 944,895

Int. Cl.[3] **C09D** *5/24*

U.S. Cl. 106—1.13 **9 Claims**

1. A gold conductor composition suitable for application in thick film microcircuitry consisting essentially of 75–90% by weight of the composition of gold powder, binder selected from the group consisting of copper oxide, cadmium oxide, bismuth oxide and mixtures of two or more of copper oxide, cadmium oxide and bismuth oxide, organic vehicle and 0.1–4% by weight of silver.

4,230,494

ARTICLE HIGHLY RESISTANT TO CORROSION BY GALLIUM PHOSPHIDE AND GALLIUM ARSENIDE

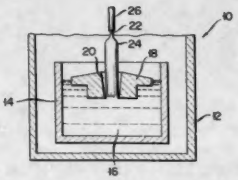
Kiyoshi Nakamura; Michiyasu Komatsu, and Masae Nakanishi, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1978, Ser. No. 924,358

Claims priority, application Japan, Jul. 14, 1977, 52/83557

Int. Cl.[3] **C04B** *35/10, 35/58;* **C09K** *3/00*

U.S. Cl. 106—14.05 **4 Claims**



1. An article having at least a portion which directly contacts molten gallium phosphide or gallium arsenide, said contacting portion comprising: a sintered body of silicon nitride and a total of from 0.5% to 20% by weight, based on said silicon nitride, of an additive selected from the group consisting of 0.01% to 10% by weight based on said silicon nitride, of aluminum oxide, 0.5% to 20% by weight, based on said silicon nitride, of cerium oxide and mixtures thereof, said additive being in the form of a compound selected from the group consisting of Si-Ce-O-N, Si-Ce-Al-O-N and mixtures thereof depending upon the additive selected, and at least a portion of said additive being present in said sintered body as a crystallized phase.

4,230,495

PROCESS FOR PRODUCING A PRESSURE-SENSITIVE CARBONLESS COPY SHEET USING MICROCAPSULES FORMED IN SITU IN A RADIATION CURABLE BINDER

Yu-Sun Lee, Parma, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 773,901, Mar. 3, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,370

Int. Cl.[2] **C09K** *3/00*

U.S. Cl. 106—14.5 **12 Claims**

1. A process for producing a non-aqueous, solvent-free coating composition without drying, said coating composition having utility in the manufacture of pressure-sensitive carbonless transfer papers, said non-aqueous, solvent-free coating composition being characterized by being radiation curable by polymerization to a tack free film and containing microcapsules having a hydrophilic core material said microcapsules being formed in situ, comprising the steps of:

(a) preparing a liquid radiation curable hydrophobic emulsion component by dispersing an emulsifier in a radiation curable hydrophobic liquid;

(b) preparing a liquid hydrophilic emulsion component by dispersing a first wall-forming material in a hydrophilic liquid containing at least one chromogenic material, said chromogenic material being soluble in said hydrophilic liquid, said first wall-forming material being reactive with a second wall-forming material to form a polymeric capsule wall, said polymeric capsule wall being substantially insoluble in said liquid hydrophilic and said liquid radiation curable hydrophobic emulsion components;

(c) mixing said liquid radiation curable hydrophobic emulsion component with said liquid hydrophilic emulsion component to form an emulsion containing droplets of said liquid hydrophilic emulsion component dispersed in said liquid radiation curable hydrophobic emulsion component; and

(d) adding said second wall-forming material to said emulsion with agitation, said agitation continuing for a period of time sufficient to allow said first and second wall-forming materials to react to form a dispersion of microcapsules in said liquid radiation curable hydrophobic emulsion component, said microcapsules having cell walls substantially impermeable to said liquid hydrophobic and said liquid hydrophilic emulsion components.

4,230,496

ZINC RICH PAINT VEHICLE

James S. Falcone, Jr., Devon, and Robert W. Spencer, Wallingford, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Filed Sep. 22, 1978, Ser. No. 944,814
Int. Cl.[2] C09D 5/10
U.S. Cl. 106—14.21 8 Claims

1. In the aqueous vehicle suitable for forming zinc rich coatings comprising a soluble quaternary ammonium silicate containing 1 to 4 alkanol groups, alkali metal silicate, a thickening agent compatible with aqueous alkaline systems and water; the improvement consisting of an organosilicone-silicate polymer which consists of 10 to 90% of a siloxane group and 10 to 90% of an alkali metal silicate group having the general formula of:

$$(MOOCR)_b\,SiO_{\frac{4-(b+c)}{2}}\,R_c'$$

M represents sodium or potassium, R stands for a divalent hydrocarbon, R' represents a monovalent hydrocarbon group; b has a value of 1 to 3; c has a value of 0 to 2 and (b+c) has a value of 1 to 3.

4,230,497

DENSE SINTERED SHAPED ARTICLES OF POLYCRYSTALLINE α-SILICON CARBIDE AND PROCESS FOR THEIR MANUFACTURE

Karl A. Schwetz, Sulzberg, and Alfred Lipp, Bad Worishofen, both of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH

Filed Feb. 26, 1979, Ser. No. 15,154
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809278
Int. Cl.[3] C04B 35/56
U.S. Cl. 106—44 23 Claims

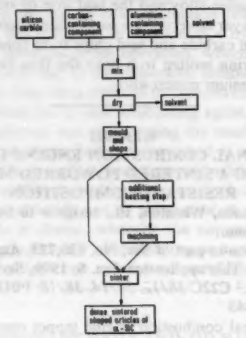
1. A sintered shaped article of polycrystalline silicon carbide having a density of at least 97% of the theoretical density of silicon carbide, a transgranular fracture mode, a flexural strength of at least 500 N/mm² up to 1600° C., and consisting essentially of at least 95.4% by weight of α-silicon carbide,

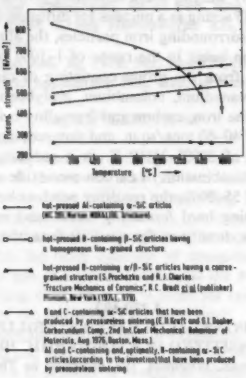
about 0.1 to 2.0% by weight of additional carbon,

about 0.2 to 2.0% by weight of aluminium,

about 0 to 0.5% by weight of nitrogen, and

about 0 to 0.1% by weight of oxygen,




Flexural strength [N/mm²]
Temperature [°C]
hot-pressed Al-containing α-SiC articles
hot-pressed B-containing β-SiC articles having a homogeneous fine-grained structure
hot-pressed B-containing α/β-SiC articles having a coarse-grained structure (S. Prochazka and R. J. Charles, "Fracture Mechanics of Ceramics", R. C. Bradt et al (publisher) Plenum, New York (1974), 1978)
B and C-containing α-SiC articles that have been produced by pressureless sintering (E. R. Kreft and G. E. Bosher, Carborundum Comp., 2nd Int. Conf. Mechanical Behaviour of Materials, Aug. 1976, Boston, Mass.)
Al and C-containing and, optionally, B-containing α-SiC articles (according to the invention) that have been produced by pressureless sintering

the α-silicon carbide being in the form of a homogeneous microstructure with an average grain size of less than 10 μm.

4,230,498

COKE OVEN PATCHING AND SEALING MATERIAL

Roger L. Rueckl, Murrysville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1978, Ser. No. 930,442
Int. Cl.[2] F27D 1/16; C04B 19/02
U.S. Cl. 106—58 4 Claims

1. A composition for the production of mixes useful for the patching and sealing of refractory structures which are subject to thermal cycling, such composition consisting essentially of, on a dry basis, the following components,

a. 55 to 80% of a high melting phase, selected from the group consisting of (i) silica, (ii) magnesia, (iii) alumina or (iv) combinations thereof,

b. 5 to 15% of a binder phase and,

c. 15 to 20% of a glass phase having a softening point between 900° and 1750° F., wherein at least 90% of said components are finer than 10 mesh.

4,230,499

CONCRETE COMPOSITION FOR MAKING CONCRETE MOLDINGS AND METHOD FOR MAKING SUCH CONCRETE MOLDINGS

Koji Nakagawa, and Yoshiharu Watanabe, both of Oumi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 897,108, Apr. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,053, Aug. 12, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,615

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 8 Claims

1. A cement composition for making concrete molding of high strength by steam curing comprising Portland cement, 3–30% by weight of insoluble (Type II) anhydrous calcium sulfate based on the weight of said Portland cement, 3% by weight or less of powders of puzzolanic material based on the weight of the Portland cement, and 0.1–3% by weight of cement dispersing agent based on the weight of the Portland cement, said soluble (Type II) anhydrous calcium sulfate being such that when contacting 1 g of insoluble (Type II) anhydrous calcium sulfate with 100 g of a 0.05% by weight Na_2HPO_4 aqueous solution at 20° C. for a period of one hour while stirring, the concentration of SO_4 ions in said solution is 0.03–0.12% by weight, and said Portland cement being substantially free from $11CaO.7Al_2O_3.CaX_2$ wherein X represents a halogen atom.

4,230,500

INORGANIC PIGMENTS AND METHOD FOR PREPARING SAME

Luigi Balducci, Alessandria, and Massimo Rustioni, Pozzolo Formigaro, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Aug. 22, 1979, Ser. No. 68,683

Claims priority, application Italy, Aug. 23, 1978, 26955 A/78

Int. Cl.[2] C09C *1/00*

U.S. Cl. 106—288 B 7 Claims

1. Greenish-yellow, yellow and orange-yellow pigments with a dominant wave length comprised between 573 and 586 mμ, said pigments being characterized in that they consist essentially of bismuth vanadate of monoclinic structure, bismuth phosphate of monoclinic structure and aluminum phosphate of orthorhombic structure and, in the case of yellow and orange-yellow pigments, also of a compound based on Bi_2O_3 and V_2O_5, the X-rays diffractogram of which shows the following peaks:

1.87, 1.88, 2.41, 2.77, 2.80, 3.11, 3.82 and 7.6 Å; said pigments being further characterized in that they have a molar ratio Bi_2O_3/P_2O_5 equal to 1 and a Bi_2O_3/V_2O_5 molar ratio comprised between 1.39 and 5.59, while their molar ratio Al_2O/V_2O_5 is different for the greenish-yellow pigments and for the yellow and orange-yellow pigments, and varies with the molar ratio Bi_2O_3/V_2O_5 according to the following scheme:

Molar ratio Bi_2O_3/V_2O_5	Molar ratio Al_2O_3/V_2O_5 of the greenish-yellow products	Molar ratio Al_2O_3/V_2O_5 of the yellow and orange-yellow products
5.59	1–3.1	>3.1–5.35
4.19	1–2.4	>2.4–4.0
3.35	1–2.1	>2.1–3.2
2.79	1–1.8	>1.8–2.7
2.39	1–1.6	>1.6–2.3
2.09	1–1.5	>1.5–2.0
1.86	1–1.4	>1.4–1.8
1.67	1–1.3	>1.3–1.6
1.52	1–1.2	>1.2–1.45
1.39	1–1.18	>1.18–1.35

4,230,501

PIGMENTS DISPERSIBLE IN PLASTICS

James Howard, Somerset, and Oscar J. Gombar, Princeton, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Jul. 31, 1978, Ser. No. 929,391

Int. Cl.[3] C04B *31/40;* C08J *3/00, 7/00;* C09C *3/00*

U.S. Cl. 106—308 Q 3 Claims

1. A pigment composition, dispersible in plastics, comprising (a) a majority, by weight, of an organic or inorganic pigment, (b) a lesser amount, compared with (a), of a waxy material formed from a mixture of

(I) at least one of the substances selected from the group consisting of waxes selected from the group consisting of natural waxes, synthetic waxes, and petroleum waxes, and

(II) at least one of the wax-like polymers selected from the group consisting of polyethylene glycols and hydrocarbon resins.

4,230,502

BUILDING MATERIAL ADDITIVE

Klaus P. Lustig, Paderborn, Fed. Rep. of Germany, and Louris Kaper, Barneveld, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 9, 1979, Ser. No. 2,167

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801932

Int. Cl.[3] C04B *7/35*

U.S. Cl. 106—314 8 Claims

1. A process for the preparation of a building material additive comprising sequentially wetting a hydrophobic constituent with a surfactant, mixing the resultant product with an air void former and optionally with one or more members selected from the group consisting of retardants, plasticizers, and accelerators, and adding a water-soluble polymer and water to form a stable dispersion.

4,230,503

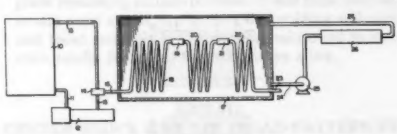
APPARATUS FOR PRODUCING MODIFIED STARCH PRODUCTS

John F. Hughes, Montreal, Canada, assignor to Cellcor Corporation of Canada Limited, Laurent, Canada

Division of Ser. No. 872,237, Jan. 25, 1978, Pat. No. 4,155,884, which is a continuation-in-part of Ser. No. 705,349, Jul. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,810, Jun. 10, 1975, abandoned. This application Apr. 9, 1979, Ser. No. 28,497

Int. Cl.[3] C13K *1/06*

U.S. Cl. 127—1 9 Claims



1. An apparatus comprising an elongated tubular heating conduit adapted to move a fluid reactant therethrough under heat exchange conditions, a continuous flow displacement pump connected to the tubular heating conduit inlet, a primary flow restricting means connected to the tubular heating conduit outlet and having a cross-sectional area not more than 25% of the cross-sectional area of the tubular heating conduit, an elongated tubular reaction conduit flow connected to the primary restricting means outlet and a second flow restricting means connected to the tubular reaction conduit outlet, said tubular conduits and flow restricting means being arranged to provide a continuous flow therethrough with the liquid emerging from the primary restricting means into the following tubular reaction conduit in the form of a fine spray or mist with a sudden release of energy.

4,230,504

METHOD OF MAKING IMPLANT PROGRAMMABLE N-CHANNEL ROM

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1978, Ser. No. 900,549
Int. Cl.[2] G11C 11/40, 17/00
U.S. Cl. 148—1.5 8 Claims

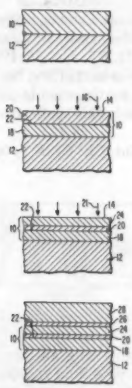
1. A method of making a read-only-memory array, while at the same time forming N-channel silicon gate transistors peripheral to the array, comprising the steps of: forming a plurality of N-channel silicon gate memory transistors in a face of a semiconductor body, and at the same time forming a plurality of said peripheral transistors spaced from the array, each of the transistors having a source, a drain and a silicon gate, the memory transistors being in a regular pattern to provide an array of memory cells; programming the array of memory cells by masked ion implant penetrating through the silicon gates of selected ones of the field effect transistors while shielding the peripheral transistors; and thereafter applying patterned metal contacts and interconnections on said face.

4,230,505

METHOD OF MAKING AN IMPATT DIODE UTILIZING A COMBINATION OF EPITAXIAL DEPOSITION, ION IMPLANTATION AND SUBSTRATE REMOVAL

Chung P. Wu, Trenton, and Arye Rosen, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,733
Int. Cl.[3] H01L 21/265, 21/20, 21/306, 21/324
U.S. Cl. 148—1.5 13 Claims



1. A method of making an Impatt diode capable of operating at millimeter-wave frequencies comprising the steps of:

(a) epitaxially depositing a layer of semiconductor material of one conductivity type on a substrate

(b) implanting into the first exposed surface of said layer conductivity modifiers to form a first active region across the layer,

(c) removing the substrate to expose the other surface of said layer, and

(d) implanting into said other surface of said layer conductivity modifiers to form a second active region with a PN junction being between the active regions.

4,230,506

CAM SHAFT MANUFACTURING PROCESS

Robert L. Clark, North Muskegon, Mich., assignor to Textron, Inc., Providence, R.I.

Filed Jun. 5, 1979, Ser. No. 45,752
Int. Cl.[3] C22C 37/00; C21D 9/30
U.S. Cl. 148—3 14 Claims

1. In a process for manufacturing a cam shaft having a series of cam lobes wherein the cam shaft is cast from a heat-treatable gray cast iron having alloyed therewith elements selected from the group consisting of silicon, manganese, chromium, nickel, copper, molybdenum and vanadium, wherein the cast cam shaft is heat treated to improve the machinability while maintaining carbide structure, and is thereafter milled, surface hardened at least at the cam lobes and thereafter machined, the improvement in the heat-treating step comprising:

heating said cam shaft to a temperature in the range of about 1550° to 1700° F. (843°–927° C.) in a time less than two hours, holding said cam shaft at said temperature for a period of one to four hours to anneal the cam shaft while retaining carbides and without substantial formation of austenite, and

cooling said cam shaft to at least 400° F. (204° C.) within one to four hours.

4,230,507

METHOD FOR SULFURIZING CAST IRON

Mikio Obayashi, Nagoya, and Naoyoshi Watanabe, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed May 22, 1979, Ser. No. 41,309
Claims priority, application Japan, May 22, 1978, 53-60789
Int. Cl.[2] C23F 7/24
U.S. Cl. 148—6.11 7 Claims

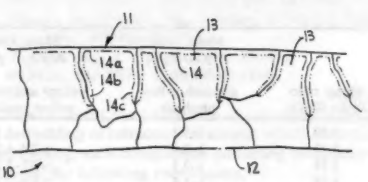
1. A method for sulfurizing cast iron, which comprises the steps of pre-treating cast iron material by immersing the material in an aqueous nitric acid solution consisting essentially of nitric acid and water for a period of from 20 minutes to 3 hours, the concentration of nitric acid in said solution being from 1 to 10 percent by volume, and thereafter sulfiding the material in molten sulfur, thereby forming a sulfurized layer on the surface of the material.

4,230,508

METHOD OF MAKING SEMICRYSTALLINE SILICON ARTICLE

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Division of Ser. No. 916,545, Jun. 19, 1978, which is a continuation-in-part of Ser. No. 751,342, Dec. 16, 1976, abandoned, and a continuation-in-part of Ser. No. 751,343, Dec. 16, 1976. This application Jul. 19, 1979, Ser. No. 58,767
Int. Cl.[2] H01L 21/223
U.S. Cl. 148—186 3 Claims



1. A method of making a photovoltaic cell from a wafer of semicrystalline silicon having a surface adapted for the impingement of light thereon, said surface being formed from individual grains of silicon having a mean diameter of at least about 100 microns and grain boundaries that at said surface are

in contact with or separated only slightly from the boundaries of adjoining grains, and a surface opposed to said impingement surface, comprising in a primary diffusion step, diffusing an impurity into said impingement surface of said wafer and then, in a secondary diffusion step, maintaining said wafer in an atmosphere substantially free from said impurity at a temperature and for a period of time sufficient to cause said impurity to penetrate between said grain boundaries and into said individual grains to form a photovoltaic junction at said impingement surface and extending across and below said surface and also into the interior of said wafer along and inwardly of said grain boundaries, said junction penetrating said wafer to a substantial depth whereby the total junction area exceeds the product of the linear dimensions of said wafer surface but not to an extent whereby said junction extends completely around the boundaries of said silicon grains or from said impingement surface to said opposed surface of said wafer.

4,230,509

PYROPHORIC FLAME COMPOSITION

Milton A. Tulis; Charles M. Lawson, both of Joppa, and Lawrence D. Whiting, III, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 13, 1979, Ser. No. 29,809
Int. Cl.³ C06B *43/00*
U.S. Cl. 149—109.4 **6 Claims**

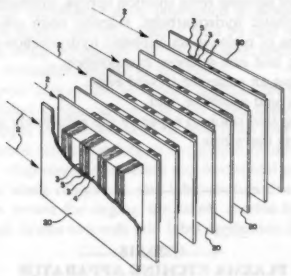
1. A low-viscosity liquid pyrophoric composition, which provides increased safety under normal handling conditions but when disseminated into the atmosphere produces a fireball of controlled ignition delay and rapid, essentially total combustion and evolution of the thermal energy thereof, consisting essentially of about from 50% to 85% by weight of a homogeneous solution of polyisobutylene in triethylaluminum and about from 15% to 50% by weight of at least one saturated aliphatic hydrocarbon containing 5 to 12 carbon atoms, said composition having a viscosity ranging about from 30 to 150 centistokes at 40° C.

4,230,510

DISTRIBUTED PHOSPHOR SCINTILLATOR STRUCTURES

Dominic A. Cusano, and Jerome S. Prener, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,086
Int. Cl.² G01T *1/164*; C09K *11/08*; B32B *31/12*
U.S. Cl. 156—67 **14 Claims**



1. A method of manufacturing multilayered scintillator bodies to increase detectable output at optical wavelengths when excited by high energy photons at supra-optical frequencies, said method comprising the steps of:

(A) applying a uniform layer of phosphor material to at least one side of each of at least two rigid substrates, said substrates being inert, transparent to radiation at supra-optical frequencies, and having substantially flat sides; and then

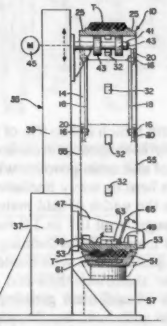
(B) forming a further layered structure by disposing an optically transparent material between layers of the phosphored substrates from step A, said laminate material being transparent to radiation at supra-optical frequencies, whereby optical wavelength output produced within the scintillator body is channeled to the exterior of the body for detection.

4,230,511

CURING A REPLACEABLE TREAD FOR A BIG TIRE

Richard J. Olsen, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 841,227, Oct. 11, 1977, Pat. No. 4,152,191.
This application Jan. 24, 1979, Ser. No. 5,932
Int. Cl.³ B29H *17/00*
U.S. Cl. 156—123 R **3 Claims**



1. A method of making a tire tread comprising providing a building and molding ring having a predetermined pattern of grooves and ridges on its outer cylindrical surface;

fabricating an endless tread assembly on said ring, the tread having a core of parallel closely spaced cord or wire reinforcement elements and an uncured elastomeric cover of tread compound, disposing said ring and said uncured tread assembly in press means having a single heated mold shoe movable radially of said ring for applying heat and molding pressure to an arcuate portion of said belt and a pressure arm disposed within said ring for applying pressure radially outward of the ring in opposition to said shoe, and indexing said ring and said tread together to place remaining arcuate portions of said tread successively in said press means to complete the molding and curing of said tread assembly, and removing said tread in its cured state axially from said ring for use on a tire.

4,230,512

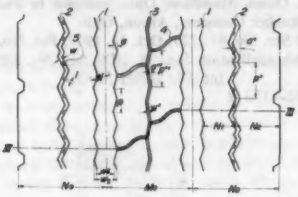
CENTER BLOCK SIDE RIB TREAD PATTERN FOR HEAVY VEHICLE RADIAL TIRES

Shigeo Makino, Tokorozawa; Norboru Sugimura, and Shigeta Aoki, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1979, Ser. No. 24,352
Claims priority, application Japan, Apr. 8, 1978, 53/40802
Int. Cl.³ B60C *11/06*
U.S. Cl. 152—209 R **8 Claims**

1. In a pneumatic radial tire for heavy vehicles having a center block-side rib type tread pattern, comprising a reinforcement structure for rigidly reinforcing that portion of the tire which is located directly beneath a tread by means of a carcass including cords arranged substantially in a radial plane and a belt layer including metal wire cords and superimposed about the carcass, two relatively wide main grooves extending in circumferential direction of the tire and spaced apart from

each other in the widthwise direction of the tire by a distance which is within a range between at least 20% of the tread width and at most 60% of the effective width of the belt layer, these two main grooves dividing the tread into a center region and two side regions, a relatively narrow zigzag or substantially zigzag auxiliary groove extending in circumferential direction of the tire and dividing each of the three regions into two portions and a branch groove located in the center region of the tread and connecting the zigzag auxiliary groove to the right and left main grooves alternately, the branch groove dividing the center region tread also in the circumferential direction, of the improvement wherein each of said main



grooves has a width which is 5 to 9% of the width of the tread and is substantially U-shaped in cross-section and in which at least those edges of said main grooves which define said center region consist of a bent or wavy line having an allocated pitch of 0.3 to 1.3 times the width of said main grooves and a swing width within a range from 0.1 to 1.0 times the width of said main groove, said main grooves forming substantially a direct through drainage path, and in which said branch groove has a depth which is far shallower than and corresponds to 14 to 36% of the depth of said main groove, said branch grooves together with said main and auxiliary grooves defining the blocks in the center region of the tread.

4,230,513

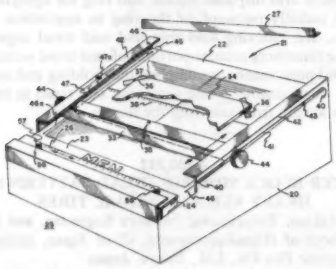
METHOD AND APPARATUS FOR MAKING RAISED AND FLAT LETTER SIGNS

Larry Cugini, Sr., and John J. Cugini, both of 23 Holley St. Extension, Danbury, Conn. 06810

Filed Mar. 26, 1979, Ser. No. 23,599

Int. Cl.[2] B65H *29/00*; B32B *31/00*

U.S. Cl. 156—299 **15 Claims**



1. A signmaking jig assembly for mounting both molded and flat sheet letters on a signblank incorporating

(A) a signblank-supporting worktable, positionable before a work station,

(B) a transversely extending setting bar movably mounted above the worktable for reciprocating movement parallel to itself above the surface of a signblank secured on the worktable,

(C) means forming a transverse front staging zone extending across the worktable near the work station and defined by a raised front transverse staging bar with which individual letters are aligned and juxtapositioned,

(D) and a movable transfer bar provided with a letter-retaining undersurface dimensioned to be lowered into the staging zone to seize the line of letters aligned therein, and to be raised and moved into a position above the signblank, from which it is lowered in juxtaposition with the setting bar to deliver the entire line of letters onto the signblank.

14. A method for making signs by mounting individual letters on a signblank temporarily secured to a worktable which incorporates a raised front transverse staging bar and a transversely-extending setting bar movably mounted for reciprocating movement parallel to itself above the signblank, in cooperation with a removable transfer bar having an adhesive under surface, comprising the successive steps of

positioning the individual letters in an aligned array in a transverse staging zone adjacent to the staging bar,

positioning the setting bar above the signblank adjacent to the level selected for the arrayed line of letters to be mounted thereon,

lowering the transfer bar into adhesive engagement with the aligned array of letters in the staging zone,

lifting the transfer bar and adhering array of letters from the staging zone,

transporting the transfer bar and adhering array of letters to the vicinity of the setting bar,

lowering the transfer bar and adhering array of letters in juxtaposition with the setting bar until the letters rest on the signblank,

bonding the letters to the signblank, and removing the transfer bar from the bonded array of letters.

4,230,514

PROCESS FOR MAKING FORM SETS FROM CARBONLESS COPY PAPER SHEETS

William J. Becker; Kenneth D. Glanz; Peter L. Foris; Robert W. Brown, and Jerrold L. Anderson, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Jul. 26, 1978, Ser. No. 928,109

Int. Cl.[2] C09J *5/00*

U.S. Cl. 156—305 **9 Claims**

1. A process for making form sets from carbonless copy paper, comprising the steps of:

(a) applying to an edge of a stack of sheets of said copy paper a non-aqueous composition selected from the group consisting of silicone resin solution sprays, substantially volatile aliphatic hydrocarbons, silicone resin solutions and solutions of resins in an aliphatic hydrocarbon solvent,

(b) drying said non-aqueous composition,

(c) applying an adhesive to said edge,

(d) drying said adhesive, and

(e) fanning said stack to separate the adhesively united unit form sets therefrom.

4,230,515

PLASMA ETCHING APPARATUS

John Zajac, San Jose, Calif., assignor to Davis & Wilder, Inc., Santa Clara, Calif.

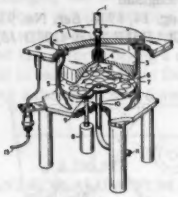
Filed Jul. 27, 1978, Ser. No. 928,594

Int. Cl.[3] C23F *1/02*; H01L *21/306*

U.S. Cl. 156—345 **9 Claims**

1. In a radial flow plasma etcher having upper and lower spaced apart electrodes having substantially circular focus, the

improvement comprising radially decreasing the spacing between the electrodes wherein the gap between the electrodes is



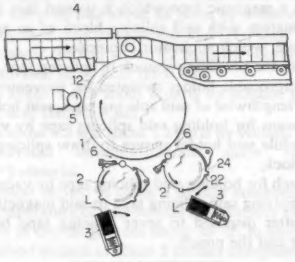
greatest at the center and smallest at the circumference of the electrodes so as to improve the uniformity of etching.

4,230,516

LABELLING MACHINE

Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo Jidoki Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1979, Ser. No. 22,489
Claims priority, application Japan, Oct. 24, 1978, 53/129976
Int. Cl.[2] B32B *31/00*; B65C *9/00, 7/00*
U.S. Cl. 156—364 **4 Claims**



1. A labelling machine comprising:

(a) a plurality of label suction drums rotatably mounted on a bedplate, each said label suction drum being provided with a plurality of arcuately spaced projections and vacuum suction outlets between said projections;

(b) a plurality of label holders for supplying labels one-by-one to a corresponding label suction drum, the labels being retained on a peripheral surface of said label suction drum between said projections by vacuum applied through said vacuum suction outlets;

(c) a label applicator drum positioned adjacent said label suction drums, the labels being held by said label suction drums being fed one-by-one to said label applicator drum to be thereafter applied to an object;

(d) an upper stop means positioned adjacent the periphery of each label suction drum and said label applicator drum, said upper stop means being spaced from said bedplate by a distance corresponding to the height of the labels, said upper stop means correcting any horizontal misalignment of the labels relative to said label suction drum; and

(e) push means for urging the labels carried by said label suction drums towards said label applicator drum.

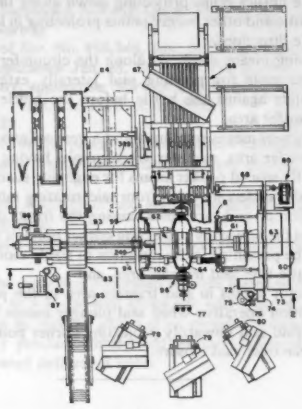
4,230,517

MODULAR TIRE BUILDING MACHINE

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Mar. 15, 1978, Ser. No. 886,743
Int. Cl.[2] B29H *17/20, 17/22, 17/26*
U.S. Cl. 156—396 **68 Claims**

1. A tire building machine comprising a tire building drum mounted on a shaft, a carrier movable axially of said shaft and including a ring in a plane normal to the axis of said shaft and concentric therewith, an arm secured to said ring, and means to



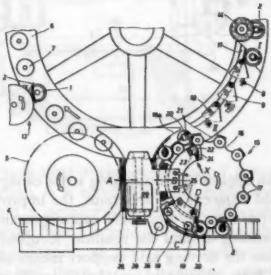
swing said arm from a shaft alignment position to a clear position to clear the interior of said ring for movement of said carrier axially of said shaft.

4,230,518

DEVICE FOR FIXING FOILS ON BOTTLES STANDING UPRIGHT

Adolf Fahnrich, Neutraubling, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth, Fed. Rep. of Germany

Filed Aug. 17, 1979, Ser. No. 67,579
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840404
Int. Cl.[2] B65C *9/04*
U.S. Cl. 156—456 **7 Claims**



1. A machine for applying foils to bottles including:

a generally circular table for rotating about a vertical axis in a horizontal plane,

a plurality of bottle supporting turntables arranged in circumferential spaced relationship around said table and rotating about vertical axes,

means along the rotational path of said table for loading bottles having closures onto successive turntables,

plunger means advanceable to engage the closure of bottles for stabilizing them on said turntable and retractable to release said bottles at a transfer area which is angularly displaced from where said bottles are loaded,

foil depositing means displaced in the rotational direction of said table from said loading means for depositing a foil

piece on the neck portion of a bottle on a passing turntable, said foil piece having corner points, said depositing means being operative to deposit respective foils with one corner point projecting above the bottle closure, an opposite corner point projecting down along the neck of the bottle and other corner points projecting in laterally opposite directions,

pressing means displaced along the circumferential path of said table for pressing said laterally extending corner points against the bottle before the bottle reaches said transfer area,

star wheel means rotating about a vertical axis adjacent said transfer area, said star wheel means having circumferentially spaced pocket means for engaging successive bottles and transferring them from said rotating table,

rotation of said turntables causing the fronts of said bottles and the upwardly projecting corner point of said foil piece to be presented in the direction of bottle motion when the bottle is in said transfer area, and

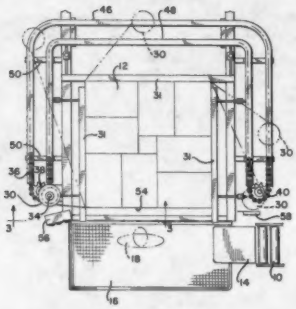
deflector means in said transfer area in the path of bottle motion operative when said plunger means has retracted to fold said upwardly projecting corner point of said foil piece over said closure.

4,230,519

TAPE APPLYING APPARATUS

Warren DuBroff, Highland Park, Ill., assignor to Lathrop Paulson Company, Chicago, Ill.

Filed Sep. 8, 1978, Ser. No. 940,494
Int. Cl.[2] B09C *17/00*
U.S. Cl. 156—468 **7 Claims**



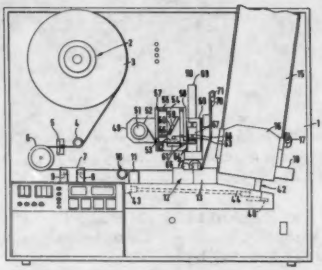
1. In an apparatus for applying strips of tape around objects positioned adjacent the apparatus, the improvement comprising a pair of tape holding reels, support means for said reels, a path extending around the position occupied by said objects, and means for driving said support means along said path, a tape end from one of said reels being applied to each object at a first location on the surface of the object, a portion of said tape being unreeled from said one reel as the support means moves around the object whereby the tape is applied over the object surface, and means for severing the tape, the severed end of the unreeled tape portion being adapted to be applied to the object surface at a second location, said tape comprising pressure sensitive tape, said support means holding the tape on one reel in an inverted position relative to the tape on the second reel whereby the pressure sensitive surface of tape unreeled from said one reel faces in a direction opposite the pressure sensitive surface of tape unreeled from said second reel, the tape on said one reel being unreeled when driving the tape support means in one direction along said path, and the tape on the second reel being unreeled when driving the tape support means in the opposite direction along said path.

4,230,520

AUTOMATIC TAPE WINDING MACHINE

Scott J. C. Morgan, Bridgnorth, England, assignor to Decca Limited, London, England

Filed Aug. 14, 1978, Ser. No. 933,556
Int. Cl.[3] B31F *5/06*; G03D *15/04*
U.S. Cl. 156—505 **5 Claims**



1. In an automatic tape-winding machine in which a loop of leader tape is extracted from a cassette to a splicing block for joinder to a magnetic tape which is wound into the cassette, the combination with said splicing block of an applicator of splicing tape, which applicator comprises:

(a) means for providing a stock of splicing tape;

(b) a reciprocable holder mounted for movement back and forth lengthwise of said splicing tape, said holder including means for holding said splicing tape by vacuum suction while said holder moves to draw splicing tape from said stock;

(c) a punch for holding said splicing tape by vacuum suction and applying said splicing tape to said magnetic tape; and

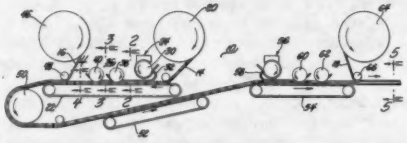
(d) a cutter disposed to sever splicing tape between the holder and the punch.

4,230,521

FOAM IMPREGNATING APPARATUS

A. Lawrence Cobb, Rochester, and Leland D. DuBrock, Troy, both of Mich., assignors to Composite Technology Corporation, Troy, Mich.

Filed Apr. 26, 1979, Ser. No. 33,591
Int. Cl.[2] B32B *31/04*
U.S. Cl. 156—549 **9 Claims**



1. An apparatus for forming continuous lengths of uncured, resin-impregnated, laminar sheet structure, said apparatus comprising a source of open-cell, resilient, foam sheet; means for feeding said foam sheet from said source; a first means for supporting said foam sheet as it is fed from said source; a first liquid resin metering device adapted to discharge a first film of uncured, thermosetting resin upon one side of said foam sheet as it passes over said first supporting means, said foam sheet feeding means including first roller means for engaging and compressing said foam sheet against the first supporting means and causing said uncured resin to impregnate the open cells of a first portion of said sheet; second means for supporting the partially resin-impregnated foam sheet; a second liquid resin metering device adapted to discharge a second film of uncured

resin upon the other side of said partially resin-impregnated foam sheet, said foam sheet feeding means including second roller means for engaging and compressing said foam sheet against said second foam sheet supporting means and causing the second resin film to impregnate the remaining open cells of said foam sheet; and means for applying a continuous sheet of reinforcing material to each side of said foam sheet, said reinforcing sheets being adhered to said foam sheet by said uncured resin.

4,230,522

PNAF ETCHANT FOR ALUMINUM AND SILICON

John E. Martin, Capistrano Beach, and Wing P. Ng, Irvine, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1978, Ser. No. 973,335
Int. Cl.[3] C09K *13/06, 13/08;* H01L *21/308*
U.S. Cl. 156—638 13 Claims

1. A method of forming a pattern of interconnections on an integrated circuit substrate, comprising:

forming a thin film layer of metallization on said substrate;

forming a layer of maskant on said layer of metallization;

patterning said layer of maskant according to said interconnections; and

etching said layer of metallization with an etchant including:

between about 20 and about 28 parts by volume of 85% concentrated orthophosphoric acid (H_3PO_4);

between about 0.8 and about 1.2 parts by volume of 70% concentrated nitric acid (HNO_3);

between about 4 and about 6 parts by volume of glacial acetic acid (HOAc); and

between about 0.8 and about 1.2 parts by volume of a 48% concentrated tetrafluoroborate anion containing (BF_4^-) material.

2. The method recited in claim 1 further comprising maintaining the temperature of said etchant substantially constant at a temperature in the range from about 30° C. to about 50° C.

3. The method recited in claim 2 further comprising agitating said substrate while said substrate is immersed in said etchant.

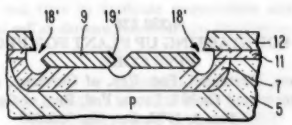
4. The method recited in claim 2 further comprising holding said etchant at a pressure below atmospheric pressure to reduce bubble formation.

4,230,523

ETCHANT FOR SILICON DIOXIDE FILMS DISPOSED ATOP SILICON OR METALLIC SILICIDES

Joseph J. Gajda, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,573
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—657 7 Claims



1. In a process for selectively etching a silicon oxide layer which is disposed atop a metallic silicide layer and wherein exposed silicon may be present below or adjacent to said silicide, the step of contacting said oxide layer with an etchant comprising:

hydrogen fluoride in polyhydric alcohol, the solution being substantially free of unbound water and ammonium fluoride;

said etchant not substantially attacking either said silicide layer or said silicon.

4,230,524

METHOD FOR THE PRODUCTION OF UNBLEACHED SULPHITE CELLULOSE OR BLEACHED CELLULOSE FROM A DEFIBRATED KNOT PULP

Ketil Hasvold, Sarpsborg, Norway, assignor to Borregaard A/S, Sarpsborg, Norway

Continuation of Ser. No. 916,346, Jun. 16, 1978, abandoned.
This application Jun. 28, 1979, Ser. No. 52,862
Claims priority, application Norway, Jul. 8, 1977, 772420
Int. Cl.[3] D21C *3/02, 3/06*
U.S. Cl. 162—25 5 Claims

1. A method for the production of sulphite cellulose from knots produced in a sulphite cellulose cooking process, comprising:

separating said knots from said sulphite cellulose after said cooking process;

defibrating said knots separated from said sulphite cellulose; and

subjecting the separated defibrated sulphite knots, while still separated, to a single-step treatment with oxygen under pressure in an alkaline milieu at an elevated temperature, to thereby produce unbleached sulphite cellulose from said separated defibrated knots.

4,230,525

PROCESS FOR IMPROVING QUALITIES OF PAPER

Hideo Yamaguchi, Naruto; Masahiro Kobayashi, Tokushima; Atsunobu Mizote, Nara, and Yoshiyuki Iwamuro, Kyoto, all of Japan, assignors to Otsuka Chemical Co., Ltd. and Sansho Co., Ltd., both of Osaka, Japan

Filed Jun. 21, 1979, Ser. No. 50,630
Claims priority, application Japan, Jun. 26, 1978, 53-77830
Int. Cl.[2] D21H *3/38*
U.S. Cl. 162—164 R 8 Claims

1. A process for improving strength and retention of paper which comprises adding to a paper pulp slurry (a) a water-soluble polymer containing hydrazide group of the following general formula:

wherein X is hydrogen atom or carboxyl group, Y is hydrogen atom or methyl group, A is acrylamide unit, methacrylamide unit, an acrylate unit, a methacrylate unit or maleic anhydride unit, B is a unit derived from a monomer copolymerizable with acrylamide, methacrylamide, an acrylate, a methacrylate or maleic anhydride, and there is the following relationship among p, q and r:

$$30\% \text{ by mole} \leqq p \leqq 100\% \text{ by mole}$$

$$0\% \text{ by mole} \leqq q+r \leqq 70\% \text{ by mole}$$

$$p+q+r=100\% \text{ by mole}$$

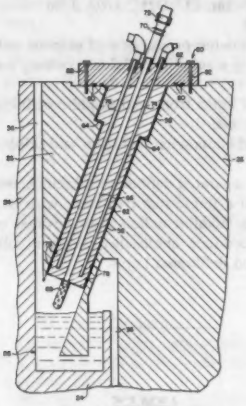
or its adduct with a water-soluble inorganic salt of an alkaline earth metal in an amount of at least 0.01% by weight based upon the weight of the pulp in the presence of (b) a heavy metal ion which is at least one ion of a heavy metal selected from the group consisting of copper, cobalt, lead, zinc, iron, tin, mercury, nickel, cadmium and manganese at a concentration of at least 0.1 ppm in the pulp slurry to chelate said polymer or its adduct.

4,230,526

LIQUID SODIUM DIP SEAL MAINTENANCE SYSTEM

Richard L. Briggs, and Sterling A. Meacham, both of Hempfield Township, Westmoreland County, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1976, Ser. No. 719,320
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 10 Claims



1. A system for removing impurities from dip seals including a vessel designed to contain radioactive material and a closure head disposed on said vessel having at least one rotatable plug for positioning refueling equipment, said rotatable plug and vessel defining an annulus to enable the rotation of said rotatable plug, said annulus having a liquid dip seal disposed thereacross for preventing the release of said radioactive material, and liquid sodium means associated with said dip seal for introducing liquid sodium to said dip seal at a temperature of at least 600° F. and for overflowing said liquid sodium from said dip seal and down said annulus thus removing said impurities therefrom.

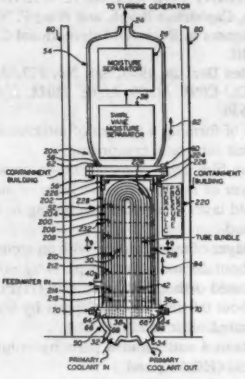
4,230,527

STEAM GENERATOR FOR USE IN NUCLEAR POWER PLANTS

Alexander Cella, Robinwood Dr., Great Notch, N.J. 07424

Continuation-in-part of Ser. No. 792,195, Apr. 29, 1977, Pat. No. 4,162,191. This application Nov. 11, 1977, Ser. No. 850,647
Int. Cl.[2] G21C *15/16*
U.S. Cl. 176—87 9 Claims

1. In a steam generator for use in a pressurized water nuclear power plant in which a turbine generator is driven by the steam output of said steam generator to provide electrical power therefrom and said steam generator is powered by a nuclear energy heat source, wherein said steam generator comprises a vertically extending hollow outer housing having an upper housing portion and a lower housing portion, with said upper housing portion having a steam outlet therein communicable with the turbine generator for providing steam generated within said steam generator to said turbine generator and a moisture separator means within the interior thereof in communication with said steam outlet for drying the generated steam provided to said steam outlet, and with said lower housing portion having heat exchange fluid and feedwater inlets and a vertically extending tube bundle within the interior thereof in flow through communication with said heat exchange fluid for enabling heat exchange fluid provided through said inlet therefor to flow through said tube bundle for providing said generated steam from feedwater provided through said inlet therefor, said tube bundle having a tube sheet at one end thereof for supporting said tube bundle with the tubes comprising said tube bundle extending through said tube sheet in said flow through communication with said heat exchange fluid inlet; the improvement comprising vertically movable grid structure means vertically extending within the interior of said lower housing portion, said grid structure means comprising a plurality of vertically spaced apart grid, said tubes vertically extending through said grid structure means with said grid structure means defining grid apertures therein through which said individual tubes comprising said tube bundle extend, each of said grids comprising an intersecting arrangement of narrow and wide members whose intersection defines said grid apertures, each of said grid apertures being in surrounding relationship with a portion of an associated one of said tubes, and means for vertically moving said grid structure a predetermined limited vertical extent within the interior of said lower housing along said tubes for vertically displacing said intersecting arrangement defining said grid apertures from a normal used position by a sufficient amount for removing the portion of each of said tubes previously surrounded by said intersecting arrangement in said normal use position from said previous surrounding relationship for enabling an enhanced reading of the condition of said tubes at said previously surrounded portion to be taken.



4,230,528

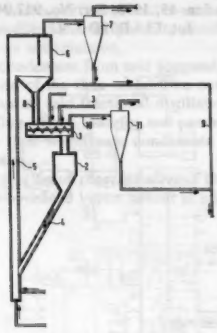
METHOD FOR STARTING UP PLANT FOR PRODUCING FINE COKE

H. J. Jagnow, Dortmund, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,835
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2739005
Int. Cl.[2] C10B *49/18, 49/20, 53/04*
U.S. Cl. 201—12 2 Claims

1. In a process for producing fine coke in a plant system including a mixing unit, by mixing high bituminous lignite coal with hot fine coke in said mixing unit and degassing the high bituminous coal, said hot fine coke serving as a heat carrier and being circulated through said system, the improvement comprising introducing inert gas into the mixing unit along with the hot fine coke prior to the introduction of the high bitumi-

nous lignite coal, and circulating said inert gas and said hot fine coke through said system, whereby a cold parts of said system



are heated up so as to minimize condensation of tar generated in the production of said fine coke in said system.

4,230,529

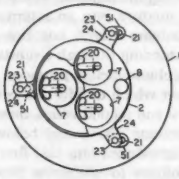
DISTILLATION APPARATUS

Yao T. Li, Huckleberry Hill, Lincoln, Mass. 01773

Filed Nov. 16, 1978, Ser. No. 961,452

Int. Cl.³ B01D *3/04*

U.S. Cl. 202—175 **9 Claims**



1. Distillation apparatus comprising one or more heat transfer tube, each of the said one or more tubes aligned about a vertical axis, means to drive said heat transfer tubes about a wobbling center on said vertical axis without rotating the transfer tubes, means to direct a stream of fluid toward the inner surface of each of said tubes, the wobble motion imparted to each of said tubes serving to cause said fluid stream to cling to the inner surface of the tube away from the wobbling center whereby the resultant revolving flow stream serves to wipe the inside surface of the tube to form a thin film with low heat resistance and thus to facilitate evaporation and carry the residue and reflux downward with low resistance.

4,230,530

SELF-CLEANING WATER DISTILLER WITH INTERMITTENT OVERFLOW

Kenneth D. Lemoine, Box 476, Gravette, Ark. 72736, and Robert R. Keegan, Fayetteville, Ark., assignors to Kenneth D. Lemoine, Gravette, Ark.

Filed Dec. 22, 1978, Ser. No. 972,352

Int. Cl.² B01D *3/02*

U.S. Cl. 202—180 **12 Claims**

1. Distillation apparatus comprising,

a boiler having at least one opening at the bottom thereof,

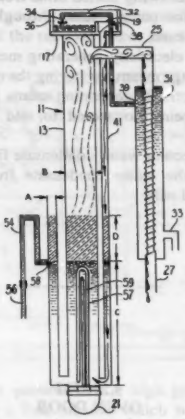
a heater for heating the liquid content of said boiler,

a vapor chamber,

a condenser,

an overflow tube connected to and extending upwardly from said opening at the bottom of said boiler, and

a siphon connected to said overflow tube substantially above



the level of said opening at the bottom of said boiler and having a U-shaped portion extending about its point of connection to said overflow tube but not above the top of said overflow tube.

4,230,531

WIND POWERED SOLAR STILL

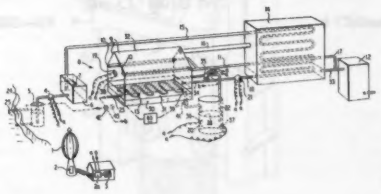
Placidus D. Fernandopulle, 17 Rue de Gerardmer, 68000 Colmar, France

Filed Feb. 22, 1978, Ser. No. 880,125

Claims priority, application United Kingdom, Mar. 3, 1977, 9028/77

Int. Cl.² B01D *3/00*; C02B *1/06*; F24J *3/02*

U.S. Cl. 202—180 **13 Claims**



1. Apparatus for producing distilled or potable water from salt water, the apparatus comprising:

inlet means for cold salt water;

condenser means having walls defining a chamber which contains first heat exchanger means, said first heat exchanger means being connected to said inlet means and having an outlet from said chamber;

solar still means, said still means having wall means defining a trough and also being capable of transmitting solar energy thereto, said trough receiving salt water from the outlet of said chamber which is evaporated in said still means and collected as a water condensate on said wall means, said still means also being provided with water condensate collecting means for collecting the condensate on said wall means;

means for conducting water vapour from said still means to said chamber of said condenser means;

brine storage means for receiving brine from said trough

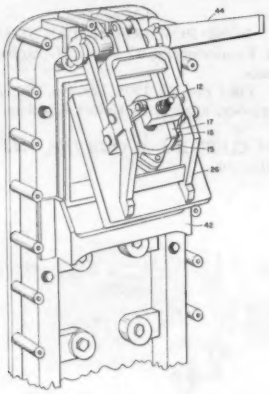
consequent to said evaporation, said brine storage means having electrical heating means for heating brine therein;
second heat exchanger means for heating the salt water in said trough;
means for withdrawing heated brine from said brine storage means and for passing same through said second heat exchanger means;
wind-powered electricity generating means;
electricity storage means for storing the output of said wind-powered electricity generating means, said electrical heating means being connected to said electricity storage means; and
means for collecting water condensate from said condenser means and the water condensate from said collecting means in said still.

4,230,532

OVEN DOOR

Edward Harris, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 16, 1979, Ser. No. 57,891
Int. Cl.³ C10B *25/12*
U.S. Cl. 202—248 **6 Claims**



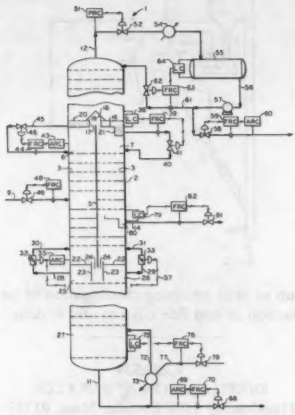
1. In a pressure chamber such as a coke oven or the like having a hinged door, actuator means for opening and closing the door, a centrally located spring contained within a spring box for exerting a force against said door, a latch bar on the door and a latching bracket on the pressure chamber, the improvement which comprises in combination:
(a) a pair of hinge links one on each side of the spring box pivotably connected to the door hinge shaft and to the spring box,
(b) a latch bar of a yoke type U configuration pivotably connected to said hinge links by means of a shaft or pivotably connected to said hinge shaft,
(c) a primary toggle link on either side of said spring box pivotably connected on one end to said spring box and door hinge links, and pivotably connected on the other end to latch bar legs, and
(d) means to limit rotation of primary toggle links and spring box around pivot connections.

4,230,533

FRACTIONATION METHOD AND APPARATUS

Victor A. Giroux, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 19, 1978, Ser. No. 917,046
Int. Cl.² B01D *3/42*
U.S. Cl. 203—1 **16 Claims**



12. A method of separating a fluid mixture including first, second and third constituents having different boiling points, the boiling point of the first being the lowest and the boiling point of the third being the highest, which method comprises:
introducing said mixture into an intermediate region of a fractionation column which contains vapor-liquid contacting trays extending through a substantial height of the column, said column being provided with a generally vertical partition which divides the central region of the column into first and second zones, there being contacting trays in said column above and below said zones, said mixture being introduced into said first zone;
operating said column to withdraw from the top of the column a stream rich in the first constituent, to withdraw from the bottom of the column a stream rich in the third constituent and to withdraw from an intermediate region of the second zone a stream rich in the second constituent;
measuring the concentration of the first constituent in the lower region of the first zone;
flowing vapor and liquid between the lower regions of the first and second zones and a region of said column below said partition; and
controlling the relative vapor and liquid flows between the lower regions of said first and second zones and the region of said column below said partition in response to the measured concentration of the first constituent.

4,230,534

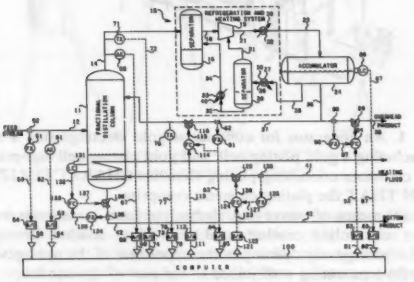
CONTROL OF A FRACTIONAL DISTILLATION COLUMN

William S. Stewart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1979, Ser. No. 23,353
Int. Cl.² B01D *3/42*
U.S. Cl. 203—1 **32 Claims**

17. A method for controlling a fractional distillation column comprising the steps of:
passing a feed mixture to be separated into said fractional distillation column;
passing a heating fluid into said fractional distillation column to thereby supply at least a portion of the heat required to effect the separation of said feed mixture;

withdrawing said heating fluid from said fractional distillation column;
withdrawing an overhead vapor stream from an upper portion of said fractional distillation column;
condensing at least a portion of said overhead vapor stream;
passing the resulting at least partially condensed overhead stream into an accumulator;
withdrawing condensate from said accumulator and passing a first portion of the thus withdrawn condensate into an upper portion of said fractional distillation column as an external reflux stream therefor and passing a second portion of the thus withdrawn condensate as an overhead product stream;
establishing a first signal representative of the predicted flow rate of said overhead vapor stream at a time T_1;



establishing a second signal representative of the percentage of said overhead vapor stream which can be removed from said accumulator as said overhead product stream while still maintaining a desired liquid level in said accumulator;
combining said first signal and said second signal to produce a third signal representative of the desired flow rate of said overhead product stream;
establishing a fourth signal representative of the highest allowable flow rate of said overhead product stream;
providing the one of said third and fourth signals representative of the lowest flow rate of said overhead product stream as a fifth signal to a means for manipulating the flow rate of said overhead product stream to thereby control the flow rate of said overhead product stream in response to said fifth signal.

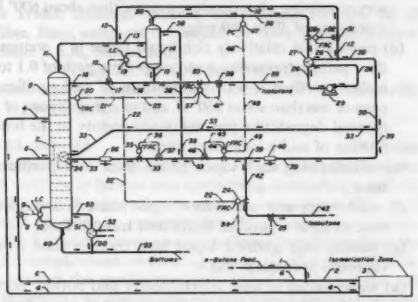
4,230,535

HEAT-PUMPED FRACTIONATION PROCESS

Leroy J. Howard, Libertyville, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 15, 1979, Ser. No. 48,859
Int. Cl.² B01D *1/28, 3/14*
U.S. Cl. 203—26 **14 Claims**

1. A process for separating two chemical compounds by fractionation which comprises the steps of:
(a) passing a feed stream comprising a first and a second chemical compound into a fractionation zone operated at fractionation conditions;
(b) removing a net bottoms stream which is rich in the first chemical compound from the fractionation zone as a first product stream;
(c) removing an overhead vapor stream which is rich in the second chemical compound from the fractionation zone, partially condensing the overhead vapor stream by direct heat exchange within an overhead receiver to produce an overhead liquid and a receiver vapor stream, supplying a first portion of the overhead liquid to the fractionation zone as reflux and removing a second portion of the overhead liquid from the process as a second product stream;
(d) heating the receiver vapor stream by indirect heat exchange against a hereinafter specified high pressure working stream;
(e) heating the receiver vapor stream by compression and thereby forming the previously specified high pressure working stream;
(f) cooling the high pressure working stream by indirect heat exchange against the receiver vapor stream;



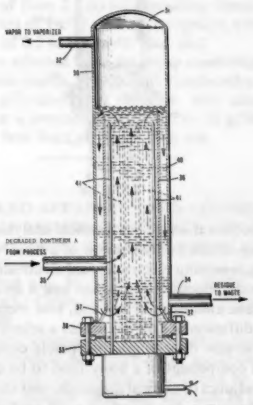
(g) passing a first portion of the high pressure working stream through a first reboiler which is used to supply heat to the fractionation zone and then into the overhead receiver; and,
(h) condensing a second portion of the high pressure working stream to thereby form a condensate stream and then passing the resultant condensate stream into the overhead receiver.

4,230,536

METHOD FOR THE DISTILLATION PURIFICATION OF ORGANIC HEAT TRANSFER FLUIDS

Charles E. Sech, 45 Greekwood, Glendale, Ohio 45246

Continuation-in-part of Ser. No. 771,984, Feb. 25, 1977, Pat. No. 4,139,418, which is a continuation-in-part of Ser. No. 570,082, Apr. 21, 1975, abandoned. This application Feb. 5, 1979, Ser. No. 9,292
Int. Cl.² B01D *3/00*
U.S. Cl. 203—89 **6 Claims**



1. A method for the purification of a heat transfer fluid which is subject to thermal degradation and is used in a closed-end process system comprising a vaporizer containing an inventory of said heat transfer fluid and a heat sink, said method comprising:

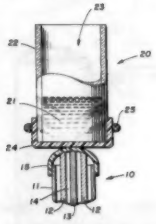
(a) withdrawing at least a portion of said heat transfer fluid inventory from said vaporizer in the liquid phase;
(b) passing said withdrawn portion to a purification zone possessing electric resistance heating means;
(c) heating said liquid portion within said purification zone by means of said heating means to form a vapor phase relatively lean in thermal degradation precursors and a liquid phase relatively rich in thermal degradation precursors possessing a temperature greater than about 600° F. at a pressure of 30 to 160 psig;
(d) passing said relatively rich-liquid phase in a continuous flow pattern traversing a narrower flow path of 0.1 to 0.5 inches to effect a wall temperature of said purification zone of less than about 650° F. and to effect deposit of said thermal degradation precursors via gravity to the bottom portion of said purification zone;
(e) withdrawing said vapor phase from said purification zone;
(f) condensing said withdrawn vapor phase in a condenser zone to form a purified liquid heat transfer fluid;
(g) passing said purified liquid heat transfer fluid to said vaporizer inventory; and
(h) withdrawing at least intermittently said bottom portion of said purification zone to remove said thermal degradation precursors.

4,230,537

DISCRETE BIOCHEMICAL ELECTRODE SYSTEM

Jacques J. Delente, University City, and Lloyd E. Weeks, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1975, Ser. No. 642,205
Int. Cl.[2] G01N *27/46, 31/14*
U.S. Cl. 204—1 T **5 Claims**



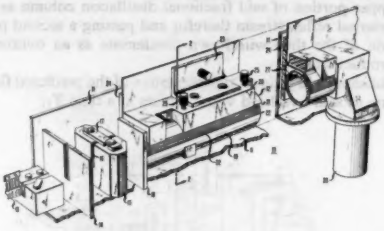
1. A method for discrete biochemical analysis employing the determination of the concentration of a dissolved gas in solution with a gas-sensing electrode, said electrode comprising an anode, cathode, electrolyte solution and a selectively permeable membrane enclosure at one end, said method comprising causing the diffusion of said gas across a selectively permeable membrane portion of a sample receptacle containing a liquid biochemical component of a body fluid to be determined as a recognized adjunct of clinical diagnosis, said sample receptacle membrane having a dry interface with said electrode membrane at the locus of said gas diffusion whereby the liquid in said sample receptacle does not come into contact with any part of said electrode and said electrolyte solution does not come into contact with any part of said sample receptacle during said gas diffusion.

4,230,538

STRIP LINE PLATING CELL

Dennis R. Turner, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1979, Ser. No. 92,380
Int. Cl.[3] C25D *5/02, 17/12, 17/28*
U.S. Cl. 204—15 **17 Claims**



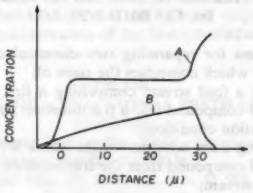
1. An apparatus for continuous gold electroplating a strip including a gold plating cell, said gold plating cell comprising a container containing plating elements CHARACTERIZED IN THAT the plating elements comprise
(a) means of conveying electrolyte from a reservoir to an electrolyte conduit, said electrolyte conduit having a passageway opening in the upper rear of the passageway;
(b) a mounting wall joined to the rear of the conduit;
(c) an anode electrode with a first portion contoured to conform to shape of conduit spaced from and extended over the conduit, the contoured portion serving simultaneously to direct the flow of the electrolyte exiting from the passageway of the conduit and to perform the electrochemical function of the anode; and
(d) an electrode positioning mounting member mounted above the contoured portion of the anode electrode, the electrode positioning mounting member including means for deflecting the contoured portion of the anode electrode to control the direction of flow of the electrolyte.

4,230,539

METHOD FOR SURFACE TREATMENT OF ANODIC OXIDE FILM

Kohichi Saruwatari; Kazuo Isawa; Masatsugu Maejima, and Takao Suzuki, all of Tokyo, Japan, assignors to Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,760
Int. Cl.[2] C23B *9/02*
U.S. Cl. 204—35 N **8 Claims**



1. A method for the surface treatment of anodic oxide film which comprises the steps of electrolysing the porous surface of anodic oxide film of aluminium or aluminium alloy in an aqueous solution of ammonium thiomolybdate and then subjecting it to a heat treatment so as to impregnate the micropores of said film with molybdenum sulfide and fix the latter therein.

4,230,540

TECHNIQUE FOR AUTOMATIC QUENCHING OF ANODE EFFECTS IN ALUMINIUM REDUCTION CELLS

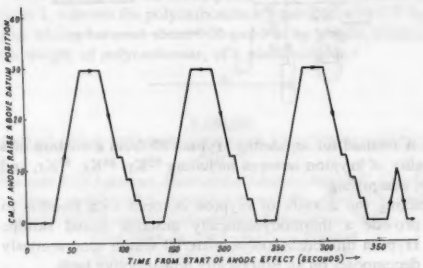
Anthony M. Archer; Edward L. Cambridge, and Douglas F. Hewgill, all of Kitimat, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 25, 1979, Ser. No. 33,213

Claims priority, application United Kingdom, Apr. 27, 1978, 16809/78

Int. Cl.[3] C25C *3/06, 7/06*

U.S. Cl. 204—67 10 Claims



1. A method of clearing anode effects in the operation of an electrolytic reduction cell for the production of aluminium by the electrolysis of alumina in a molten fluoride bath which comprises raising the anode or anodes from a datum position by a predetermined distance or until a predetermined high cell voltage is established and lowering the said anode or anodes, such raising and lowering being performed in such manner that short circuiting between said anode or anodes and the pool of molten aluminium in the bottom of the cell takes place during such anode movement as the result of local upward movement of said molten metal due to electromagnetic effects, fresh alumina being added to said molten fluoride bath in conjunction with movement of said anode or anodes of said cell.

4,230,541

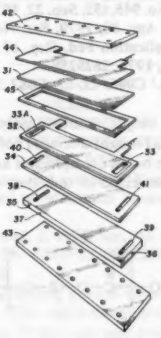
PRETREATMENT OF CATHODES IN ELECTROHYDRODIMERIZATION OF ACRYLONITRILE

Christopher J. H. King, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 21, 1979, Ser. No. 77,869

Int. Cl.[3] C25B *3/10*

U.S. Cl. 204—73 A 7 Claims



1. In an electrochemical process for hydrodimerization of acrglonitrile which comprises electrolyzing in a reaction cell an aqueous electrolyte solution, the aqueous electrolyte solution being in contact with a cadmium cathode surface, the improvement comprising contacting the cathode surface with an oxidizing agent comprising acidic hydrogen peroxide before electrolyzing the aqueous electrolyte solution.

4,230,542

ELECTROLYTIC PROCESS FOR TREATING ILMENITE LEACH SOLUTION

Carlo Traini; Giuseppe Bianchi, and Alberto Pellegri, all of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Jul. 5, 1979, Ser. No. 55,018

Claims priority, application Italy, Oct. 13, 1978, 28736 A/78; Jan. 11, 1979, 19206 A/79

Int. Cl.[3] C25B *1/00, 1/06*

U.S. Cl. 204—93 10 Claims

1. A method of reducing ferric ions in a sulfuric acid ilmenite leach solution to ferrous ions comprising circulating a sulfuric acid ilmenite leach catholyte solution containing Ti_{4+} ions through the cathodic compartment of an electrolysis cell separated by a fluid impervious anion exchange membrane from the anodic compartment, circulating a ferrous sulfate anolyte solution through the anodic compartment of the electrolysis cell and impressing an electrolysis current across the cell reducing the ferric ions in the catholyte to ferrous ions and oxidizing a portion of the ferrous ions to ferric ions in the anolyte.

4,230,543

CATHODE FOR ELECTROLYSIS OF AQUEOUS SOLUTION OF ALKALI METAL HALIDE

Keiji Kawasaki, Tokyo, and Itsuaki Matsuda, Yokohama, both of Japan, assignors to Showa Denko K.K., Japan

Filed Apr. 3, 1979, Ser. No. 27,010

Claims priority, application Japan, Apr. 7, 1978, 53-40237; Sep. 11, 1978, 53-110672

Int. Cl.[3] C25B *1/36, 11/04;* C25D *3/56*

U.S. Cl. 204—98 12 Claims

7. In the process for electrolysis of an aqueous solution of an alkali metal halide, the improvement which comprises using a cathode for the electrolysis of an aqueous solution of an alkali metal halide, said cathode being composed of a metallic substrate and a coating of iron metal or iron metal and cobalt metal deposited on its surface at a current density of 1 to 10 A/dm^2 and at a temperature of 20° to 90° C. from an aqueous electroplating bath consisting essentially of an aqueous solution having a pH value of from 2.5 to 6.0 containing therein

(i) a metallic ion of Fe^{++} or Fe^{++} together with Co^{++} in an amount of 0.5 to 0.9 mole/liter, and

(ii) an additive selected from the group consisting of dextrin, water-soluble starch, poly(2-diethylaminoethyl methacrylate) and poly-aluminum chloride, said additive being employed at a concentration of 0.5 to 10 g/liter and said bath being free from an ammonium ion.

4,230,544

METHOD AND APPARATUS FOR CONTROLLING ANODE PH IN MEMBRANE CHLOR-ALKALI CELLS

Wayne A. McRae, Zurich, Switzerland, assignor to Ionics Inc., Watertown, Mass.

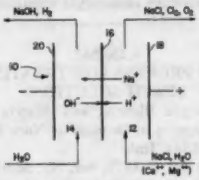
Filed Aug. 31, 1979, Ser. No. 71,637

Int. Cl.[3] C25B *1/34, 9/00, 15/08, 13/08*

U.S. Cl. 204—98 16 Claims

1. In a process wherein an aqueous alkali metal chloride solution is electrolyzed in a chlor-alkali appartus including a cell having an anode compartment containing an anode capable of generating chlorine and lesser amounts of oxygen from aqueous chloride solution, a cathode compartment containing a cathode and a substantially fluid impervious, cation permselective membrane separting said anode compartment from said cathode compartment, the improvement comprising controlling the pH of the anolyte by operating said anode to have an oxygen evolution efficiency substantially chemically equiva-

lent to the hydroxide ion transfer efficiency of the said membrane whereby the formation of excessive chlorates and hypochlorites in said anolyte and insoluble metallic hydroxide in said membrane is substantially reduced.



4,230,545

PROCESS FOR REDUCING LEAD PEROXIDE FORMATION DURING LEAD ELECTROWINNING

Raymond D. Prengaman, Arlington, and Herschel B. McDonald, Red Oak, both of Tex., assignors to RSR Corporation, Dallas, Tex.

Filed Nov. 13, 1979, Ser. No. 93,514
Int. Cl.³ C25C *1/18*
U.S. Cl. 204—114 **14 Claims**

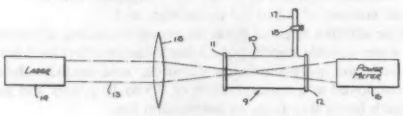
1. A process for reducing lead peroxide formation when electrowinning lead from an inorganic acid electrolyte, which comprises dissolving at least 250 ppm of arsenic ion in the electrolyte and thereafter electrowinning the lead while maintaining an arsenic ion concentration of at least 250 ppm.

4,230,546

METHOD OF MOLECULAR SPECIE ALTERATION BY NONRESONANT LASER INDUCED DIELECTRIC BREAKDOWN

Avigdor M. Ronn, Great Neck, N.Y., assignor to Research Foundation of the City University of New York, New York, N.Y.

Filed Aug. 19, 1977, Ser. No. 825,987
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **13 Claims**



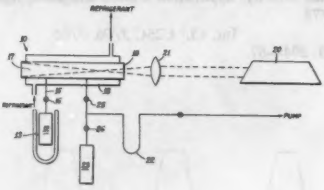
1. A method for obtaining a stable end product comprising in combination the steps of confining a quantity of a dissociative molecular specie in a gaseous state at a pressure sufficient to maintain said specie in a collision dominated regime, irradiating said specie with the output from a laser in discrete pulses having a predetermined power level per pulse and having a frequency displaced from any absorption frequencies of said specie and any other specie that may be present, said power level being selected in relation to said pressure to cause with each output pulse of said laser nonresonant dielectric breakdown in said specie accompanied by severance of the weakest bond and at least temporary formation of at least two fragments from said specie, extracting from the products of said dielectric breakdown a stable end product containing one of said fragments, and continuing said irradiation of said specie until a desired quantity of said stable end product has been formed.

4,230,547

METHOD FOR SEPARATING KRYPTON ISOTOPES

John T. Porter, II, Del Mar, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Nov. 3, 1977, Ser. No. 848,248
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **10 Claims**



1. A method for separating krypton 85 from a mixture of a plurality of krypton isotopes including ^{83}Kr, ^{84}Kr, ^{85}Kr, and ^{86}Kr, comprising

reacting the mixture of krypton isotopes with fluorine to provide a thermodynamically unstable mixed isotope krypton difluoride source material which spontaneously decomposes on an isotopically non-selective basis,

maintaining said mixed isotope krypton difluoride source material at a low temperature of less than about 0° C. while selectively irradiating said mixed isotope krypton difluoride source material with infrared radiation at a wavelength at a frequency selected from the asymmetric stretching frequency of the $^{85}KrF_2$ molecule at 586.7 cm^{-1}, the ν_2 vibrational frequency of the $^{85}KrF_2$ molecule at 233 cm^{-1}, the ν_3 vibrational frequency of the $^{85}KrF_2$ molecule at 558 cm^{-1} or the $\nu_1+\nu_3$ combination vibrational frequency of the $^{85}KrF_2$ molecule at 1032 cm^{-1} which frequency is selectively absorbed by ^{85}krypton difluoride and decomposing the selectively excited ^{85}krypton difluoride compound to ^{85}krypton and fluorine, and

separating the decomposition product ^{85}krypton from the fluorine and remaining undecomposed krypton difluoride source material.

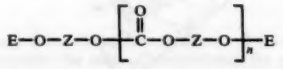
4,230,548

POLYCARBONATES WITH END GROUPS CONTAINING BONDS WHICH CAN BE CROSSLINKED BY UV LIGHT

Siegfried Adelmann; Dieter Margotte, and Hugo Vernaleken, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 945,152, Sep. 22, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 34,839
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746139; Jul. 4, 1978, 2829258
Int. Cl.³ C08G *63/62*; C08J *3/28*
U.S. Cl. 204—159.14 **18 Claims**

1. High-molecular weight aromatic polycarbonates having molecular weights $\overline{M}_w$ (weight-average) between about 10,000 and 200,000 which are based on diphenols and monofunctional chain stoppers, characterized in that they correspond to the formula (I)



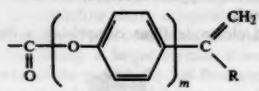
(I)

in which

Z denotes the radical of a diphenol,

n denotes an integer from about 20 to 400,

E denotes



wherein

m denotes 0 or 1 and

R denotes H or C_1–C_3-alkyl.

3. A process for the modification of the polycarbonates of claim 1, wherein the polycarbonate is irradiated with UV light, after adding between about 0.05 and 5%, by weight, relative to the weight of polycarbonate, of a photoinitiator.

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SEPARATOR MEMBRANES FOR ELECTROCHEMICAL CELLS

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Joseph C. Sentisi, Ozone Park, all of N.Y., assignors to RAI Research Corporation, Hauppauge, N.Y.

Filed May 31, 1977, Ser. No. 802,035

Int. Cl.³ C08F *259/08, 255/02, 2/46*

U.S. Cl. 204—159.17 **25 Claims**

1. An improved process for the preparation of a membrane suitable for use in electrochemical cells comprising:

(a) forming a grafting solution comprising a hydrophilic monomer, and a chlorinated organic solvent;

(b) placing said solution in contact with an inert polymeric film;

(c) irradiating said contacted film to graft polymerize said hydrophilic monomer onto the film, while inhibiting homopolymerization of said graft monomer; and

(d) contacting said irradiation grafted film with an emulsifier to reduce the electrolytic resistance of said membrane.

4,230,550

RADIATION CURABLE BARRIER COATING HAVING FLEXIBILITY AND SELECTIVE GLOSS

Kent D. Vincent, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 6, 1979, Ser. No. 64,290

Int. Cl.² C08F *2/50, 120/10*

U.S. Cl. 204—159.23 **13 Claims**

1. A composition of matter for application as a barrier coating, said composition consisting essentially of:

trimethoxymethyl tri-2-ethoxy acrylate methyl melamine;

silica; and

a photoinitiator.

4,230,551

ELECTROSYNTHESIS PROCESS FOR MAKING AMINE/ALDEHYDE POROUS STRUCTURES AND POWDERS

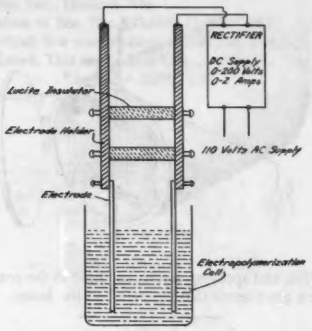
Ival O. Salyer, Dayton, and Arthur M. Usmani, Centerville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Oct. 2, 1975, Ser. No. 618,995

Int. Cl.³ C25D *15/00;* **C25B** *3/10*

U.S. Cl. 204—181 R **1 Claim**

1. A process for making porous urea/formaldehyde structures comprising solid approximately-spherical crosslinked particles of less than 10 microns, said process comprising electrolyzing an aqueous solution of urea-formaldehyde prepolymer, the molar ratio of urea and formaldehyde in the prepolymer being about 0.74, the pH of the solution being electrolyzed being about 4.5, the percent urea and formaldehyde pre-polymer in solution being about 18.5 percent prior to electrolysis, and the current density being about 90 milliamperes



per square inch of anode surface available for structure formation.

4,230,552

NOVEL PIGMENT GRINDING VEHICLE

Karl F. Schimmel, Verona, Pa.; Lance C. Sturni, Delaware, Ohio, and Martin J. Robles, Hyattsville, Md., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 869,197, Jan. 13, 1978, Pat. No. 4,186,124, which is a continuation-in-part of Ser. No. 601,109, Aug. 1, 1975, abandoned. This application Jul. 20, 1979, Ser. No. 59,409

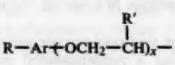
Int. Cl.³ C25D *13/00*

U.S. Cl. 204—181 C **5 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode and an anode in an aqueous electrodepositable composition by passing an electric current between said anode and said cathode, wherein the electrodepositable composition comprises an aqueous dispersion of a polymeric product comprising the acidified reaction product of:

(A) a polymeric polyepoxide having a 1,2-epoxy equivalency greater than one,

(B) an organic tertiary amine containing an alkylaryl-polyether moiety having the following structural formula:



where Ar is an aryl radical, R is an alkyl radical containing from 1 to 30 carbon atoms, R' is hydrogen or lower alkyl containing from 1 to 5 carbon atoms and x is equal to 3 to 20.

4,230,553

TREATING MULTILAYER PRINTED WIRING BOARDS

Charles J. Bartlett, Madison; Ronald J. Rhodes, South Plainfield, and Ray D. Rust, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

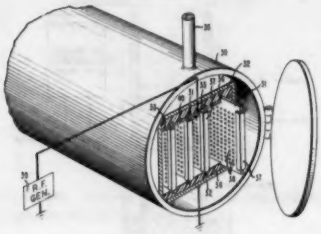
Filed Apr. 23, 1979, Ser. No. 32,339

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 E **9 Claims**

1. A process for treating a laminated structure having metal layers separated by an insulating layer, and holes therethrogh,

comprising the steps of placing the structure in an evacuated chamber containing oxygen, making electrical contact to the



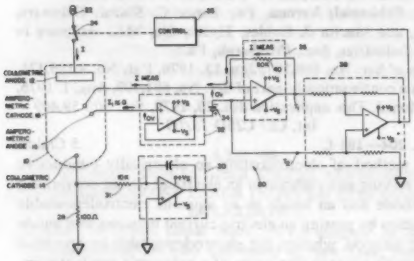
metal layers, and applying an electric field to the contacts so as to create a gas plasma that extends into the holes.

4,230,554

APPARATUS FOR MEASURING IONS IN SOLUTION

Gordon C. Blanke, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 3, 1978, Ser. No. 921,401
Int. Cl.³ G01N *27/44*
U.S. Cl. 204—195 T **5 Claims**



1. Electrochemical titration apparatus for measuring a constituent of a sample in solution and including coulometric generating means for generating ions combinable with the sample constituent and amperometric detecting means for detecting the presence of uncombined ions in said solution, each of said coulometric generating means and said amperometric detecting means including a respective pair of electrodes for contacting said sample in solution, the improvement comprising:

means for enabling said coulometric generating means;

means for applying a predetermined potential difference between the amperometric detecting electrodes while simultaneously establishing an operating condition of substantially zero current flow at one of said amperometric detecting electrodes; and

means for monitoring flow of current between the other of said amperometric detecting electrodes and one of said coulometric generating electrodes.

4,230,555

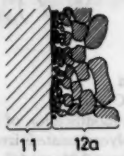
OXYGEN GAS ANALYZER USING A SOLID ELECTROLYTE

Seisuke Sano; Masato Maeda, and Morimichi Iguchi, all of Musashio, Japan, assignors to Yokogawa Electric Works, Ltd. and Mitaka Instrument Co., Ltd, both of Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 73,915
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—195 S **2 Claims**

1. An oxygen gas analyzer having a solid-electrolyte partition wall with electrode films attached to the sides thereof and serving to generate a detection signal proportional to the difference between the oxygen concentrations on the two sides of said partition wall;

each of said electrode films comprising a metal powder



having a particle size which gradually decreases toward the deepest region of the film adjacent said partition wall;

platinum screens bonded to said electrode films; and

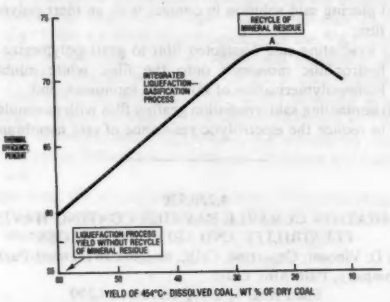
leadwires secured to said platinum screens for providing a detection signal therethrough.

4,230,556

INTEGRATED COAL LIQUEFACTION-GASIFICATION PROCESS

Norman L. Carr, Allison Park, Pa., and Bruce K. Schmid, Denver, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 970,005
Int. Cl.² C10G *1/00, 1/08;* C10J *3/00*
U.S. Cl. 208—8 LE **9 Claims**


RECYCLE OF MINERAL RESIDUE
A
INTEGRATED LIQUEFACTION-GASIFICATION PROCESS
LIQUEFACTION PROCESS YIELD WITHOUT RECYCLE OF MINERAL RESIDUE
YIELD OF 454°C+ DISSOLVED COAL, WT % OF DRY COAL

1. An integrated coal liquefaction-gasification process wherein the net production of normally solid dissolved coal containing mineral residue from the liquefaction zone comprises the hydrocarbonaceous feed for the gasification zone; said process comprising passing mineral-containing feed coal, hydrogen, recycle dissolved liquid solvent, recycle normally solid dissolved coal and recycle mineral residue to a coal liquefaction zone which does not contain a fixed bed of added catalyst to dissolve hydrocarbonaceous material and to produce a mixture comprising hydrocarbon gases, dissolved liquid, normally solid dissolved coal and suspended mineral residue; passing a liquefaction zone effluent stream through a vapor-liquid separator means to remove overhead hydrogen, hydrocarbon gases and naphtha from a residue slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; recycling to said liquefaction zone a first portion of said residue slurry; passing a second portion of said residue slurry to product separation means including vacuum distillation means; passing a third portion of said residue slurry through hydroclone means; recovering from said hydroclone means an overhead slurry comprising liquid coal and normally solid dissolved coal containing particles of suspended mineral residue having a smaller median diameter as compared to the median diameter of the particles in said first portion of residue slurry; recycling said overflow slurry to said liquefac-

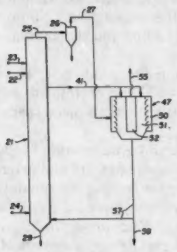
tion zone to reduce the median diameter of the particles recycled to said liquefaction zone; recovering from said hydroclone means an underflow slurry comprising liquid coal and normally solid dissolved coal containing particles of suspended mineral residue having a larger median diameter than the median diameter of the particles in said first portion of residue slurry; passing said underflow slurry to said product separation means; separating liquid coal in said vacuum distillation means in said product separation means from a gasifier slurry comprising normally solid dissolved coal and mineral residue; passing said gasifier slurry to the gasification zone for conversion to hydrogen; and passing said hydrogen to the coal liquefaction zone.

4,230,557

REMOVAL OF ENTRAINED SOLIDS FROM RETORTED HYDROCARBONACEOUS VAPORS

Corey A. Bertelsen, Oakland, and Byron G. Spars, Mill Valley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 22, 1979, Ser. No. 13,991
Int. Cl.³ C10B *53/06*; C10G *1/02*
U.S. Cl. 208—8 R **10 Claims**



1. In a retorting process wherein raw hydrocarbon-containing particles are introduced into a retorting zone and retorted therein to form retorted solids and hydrocarbonaceous vapors by heating said particles to retorting temperatures by heat transfer from solid heat carrier particles passed through the retorting zone; and a stream comprising said hydrocarbonaceous vapors contaminated with entrained finely divided solids is withdrawn from the retorting zone; the improved method of removing at least a portion of said entrained finely divided solids from said hydrocarbonaceous vapors which comprises:

(a) introducing solid contact material predominantly of a size in the range from 75 microns to 8 millimeters and at a temperature within the range from 25° C. (45° F.) below the retorting temperature to 55° C. (100° F.) above the retorting temperature to an upper portion of a granular filtration zone, said solid contact material being selected from the group consisting of retorted solids, heat carrier particles and mixtures of retorted solids and heat carrier particles;

(b) passing said solid contact material downwardly through said filtration zone as a bed of contiguous particles at a velocity in the range of 7.6 to 1220 cm per hour;

(c) passing said stream at substantially said retorting temperature transversely through said bed whereby at least a portion of said finely divided solids is deposited in said bed; and

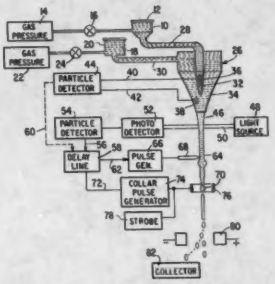
(d) withdrawing a mixture said of contact material and said finely divided solids from a lower portion of said filtration zone.

4,230,558

SINGLE DROP SEPARATOR

Mack J. Fulwyler, Los Alamos, N. Mex., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 843,696, Oct. 19, 1977, Pat. No. 4,148,718, which is a continuation of Ser. No. 694,532, Jun. 10, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,853
Int. Cl.³ B07C *5/34*
U.S. Cl. 209—3.1 **6 Claims**



1. An apparatus for detecting and selectively separating small particles in a fluid including in combination:

forming means for forming a moving fluid stream in air having a substantially constant velocity containing said particles asynchronously spaced in said stream,

sensing means adjacent said fluid stream and operative to detect a particle in said stream passing a first location and to develop a detection signal,

pulse generation means coupled to said sensing means and communicating with said fluid stream at a second location, said pulse generation means operative in response to said detection signal to apply one of an electrical pulse and a quantum of radiant energy to said stream and particle therein at said second location for asynchronously disturbing said stream and creating a single isolated droplet from said stream surrounding said particle separated from the preceding and succeeding fluid stream.

4,230,559

APPARATUS FOR PNEUMATICALLY SEPARATING FRACTIONS OF A PARTICULATE MATERIAL

William C. Smith, West Vancouver, Canada, assignor to Rader Companies, Inc., Portland, Oreg.

Continuation of Ser. No. 876,131, Feb. 8, 1978, Pat. No. 4,166,027, which is a continuation of Ser. No. 738,635, Nov. 3, 1976, abandoned. This application Nov. 22, 1978, Ser. No. 962,951
The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.
Int. Cl.³ B07B *4/02*
U.S. Cl. 209—139 R **4 Claims**

1. Apparatus for penumatically separating fractions of a heterogeneous mixture of particulate material according to relative densities and/or aerodynamic properties comprising:

an unobstructed, substantially straight primary duct which is not inclined from vertical by more than about 10° and which narrows near the top to define a region of accelerating airflow;

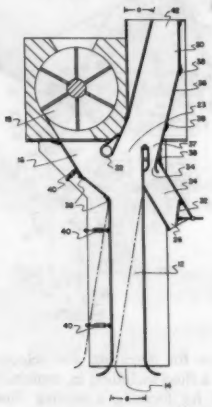
airlock feed means for feeding all material to be separated into said primary duct at a location upstream of said region of accelerating airflow and without admitting a substantial amount of air into said primary duct;

a discharge duct communicating with the top of said primary duct and extending upwardly therefrom;

means for producing an upwardly moving column of air in said primary and discharge ducts having a velocity opera-

ble to raise a light fraction of said material while a heavy fraction falls to the bottom of said primary duct;

a secondary duct which is displaced horizontally from said primary duct and which communicates only with said discharge duct and the surrounding atmosphere so that said secondary duct provides an inlet for admitting a column of air directly, entirely from the surrounding



atmosphere into the interior of said discharge duct at a location shortly downstream of said region of accelerating airflow, to increase the volume of air in said upwardly moving column of air in said discharge duct, and

adjustable damper means operable to adjustably constrict said secondary duct for regulating the velocity of air moving through said discharge duct.

4,230,560

NONMAGNETIC CONDUCTIVE MATERIAL SEPARATING APPARATUS

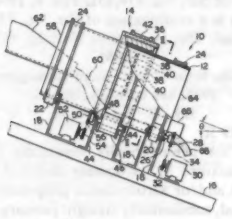
Takato Nakajima, Sakakimachi, Japan, assignor to Kanetsu Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Jul. 23, 1979, Ser. No. 59,648

Claims priority, application Japan, Aug. 15, 1978, 53/98711

Int. Cl.³ B03C 1/12

U.S. Cl. 209—212 **5 Claims**



1. A nonmagnetic conductive material separating apparatus comprising: a drum composed of nonmagnetic substance and rotated in one direction around a longitudinal center axis thereof, wherein composite input material posterior to previous removal of magnetic substance therefrom is introduced into said drum; and means for generating a magnetic field which rotates in the direction reverse to rotation of said drum substantially coaxially therewith so as to exert an electromagnetic force in the direction reverse to rotation of said drum.

4,230,561

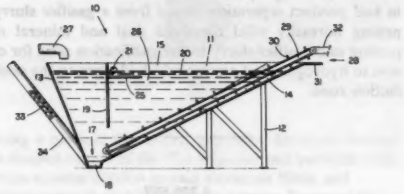
METHOD AND APPARATUS FOR SEPARATING CLAY FROM COAL FINES

Russell L. McMurray, R.R. #2, Box 213, Du Quoin, Ill. 62832

Filed Apr. 2, 1979, Ser. No. 26,428

Int. Cl.³ B03B 5/54

U.S. Cl. 209—464 **10 Claims**



1. An apparatus for use in the separation of clay from coal fines which comprises:

a hopper including a bottom, a front wall, side walls and a rear wall, the side walls diverging upwardly, the rear wall having the top and extending upwardly from the bottom at an angle to horizontal of less than about 45 degrees, the rear wall including a central, rectangular wall portion and a pair of upwardly-widening triangular wall portions on either side of the rectangular wall portion, thereby defining a channel having the rectangular wall portion at the bottom;

a first baffle mounted to said hopper and extending vertically downward toward the bottom of said hopper, said first baffle being positioned in a plane spaced horizontally from the front wall;

a second, horizontal baffle mounted to said hopper;

a conveyor positioned adjacent and extending along the rear wall of said hopper from approximately the bottom of said hopper to above the top of the rear wall of said hopper, said conveyor comprising a flight conveyor having numerous, transverse blade members, the blade members being complementary in shape with the central, rectangular wall portions of the rear wall and being received in the channel defined by the rear wall;

drive means for driving said conveyor;

feed means for feeding a water suspension of coal fines containing clay particles into said hopper between the front wall of said hopper and said baffle;

an apron extending outwardly of said hopper from the rear wall of said hopper; and

overflow means for receiving water suspension of clay and directing the suspension from said hopper, said overflow means including at least one overflow port located in one of the side walls of said hopper between said first baffle and the rear wall of said hopper, said second baffle extending directly below the overflow port, at least a portion of the overflow port being located below the top of the rear wall of said hopper, said first baffle extending upwardly at least as high as the bottom of the overflow port.

4,230,562

METHOD FOR DEPOLLUTING FRESH WATER AND SALT WATER BODIES FROM CRUDE OIL, PETROLEUM PRODUCTS AND THEIR DERIVATIVES

Roberto Olivieri, Mentana; Andrea Robertiello, and Ludwig Degen, both of Rome, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Aug. 8, 1977, Ser. No. 823,043

Claims priority, application Italy, Sep. 1, 1976, 26751 A/76; Jun. 8, 1977, 24495 A/77

Int. Cl.² C02B 9/02

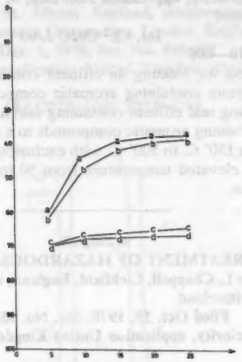
U.S. Cl. 210—610 **2 Claims**

1. In a method for depolluting fresh and sea water bodies

from crude oil petroleum and products and their derivatives by spreading onto the water bodies compounds which contain phosphorus and slow-release nitrogen in a form which can be assimilated by aquatic microorganisms capable of metabolizing hydrocarbons, the improvement which comprises:

using as said phosphorus source lecithin; and

using as said slow-release nitrogen source oxamide, at least



about 6.5 milligrams of said oxamide being present per 100 milligrams of pollutants, wherein at least about 5 milligrams of soybean lecithin are present per 100 milligrams of pollutants, said phosphorus and said nitrogen in said compound being present in an amount sufficient to increase the natural biodegradation of said pollutants caused by the metabolization of hydrocarbons by said aquatic microorganisms.

4,230,563

TREATMENT OF BIOLOGICALLY-DEGRADABLE WASTE

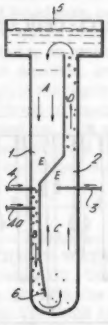
Frank C. Roesler, deceased, late of Stockton-on-Tees, England (by Johanna Roesler, executrix), assignor to Imperial Chemical Industries Limited, London, United Kingdom

Continuation of Ser. No. 794,403, May 6, 1977, abandoned. This application Oct. 31, 1978, Ser. No. 956,923

Claims priority, application United Kingdom, May 14, 1976, 19980/76

Int. Cl.[2] C02C *1/02*

U.S. Cl. 210—629 **1 Claim**



1. A method for the biological degradation of a solids-liquid sewage mixture which comprises a step wherein the solids-liquid sewage mixture is circulated through a system comprising a downcomer and a riser communicating with each other at their upper and lower ends, the downcomer having an upper portion of enlarged cross-sectional area and a lower portion of reduced cross-sectional area and a connecting portion connecting the upper and lower downcomer portions, said connecting portion being of lesser length than the upper portion and the lower portion, said upper and lower portions having substantially constant cross-sections along their lengths, the riser having a lower portion of enlarged cross-sectional area and an upper portion of reduced cross-sectional area and a connecting portion connecting the upper and lower riser portions, said connecting portion being of lesser length than the upper riser portion and the lower riser portion, said upper and lower riser portions having substantially constant cross-sections along their lengths, the combined cross-sectional area of the upper portions of the downcomer and riser being substantially equal to the combined cross sectional area of the lower portions of the downcomer and riser, air being injected into the riser to start the solids-liquid sewage mixture circulating around the system and an oxygen-containing gas being injected into the sewage as it passes through the lower portion of reduced cross-section of the downcomer, the liquid velocity in the upper portion of the riser being not less than 1 meter/second and the liquid velocity in the lower portion of the downcomer being not less than 1.2 meters/second.

4,230,564

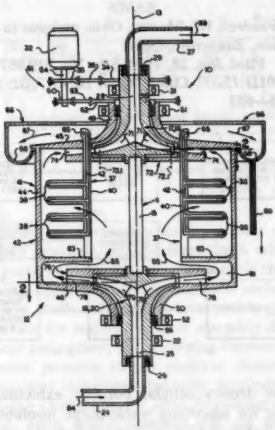
ROTARY REVERSE OSMOSIS APPARATUS AND METHOD

Bowie G. Keefer, 4324 W. 11th Ave., Vancouver, British Columbia, Canada (V6R 2M1)

Continuation-in-part of Ser. No. 806,704, Jun. 15, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,550

Int. Cl.[2] B01D *31/00, 13/00*

U.S. Cl. 210—652 **27 Claims**



1. Apparatus for separation of feed fluid into concentrate and permeate fluid fractions by pressure applied to selective membrane means, the apparatus including first and second rotors, means to power the first rotor for rotation about a central axis at a first angular velocity, and means to recover energy from at least one of the fluid fractions when removed from the second rotor, the first rotor having impeller means to impart pressure energy and kinetic energy to the feed fluid, the second rotor having membrane pressure vessel means to contain and support the membrane means, the apparatus being further characterized by:

(a) the second rotor having a diffuser means for the impeller means, the second rotor and the diffuser means being mounted for concurrent rotation about the central axis at a second angular velocity which is less than the first angular velocity,

so that the diffuser means converts some of the kinetic energy of the feed fluid from the impeller means into a further increment of pressure energy.

4,230,565

METHOD FOR PURIFYING PHOSPHATE CONTAINING WASTE WATERS

Dietfried Donnert, Karlsruhe, and Siegfried Eberle, Eggenstein-Leopoldshafen, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe, GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,991

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721298

Int. Cl.² C02B *1/14*

U.S. Cl. 210—683 **6 Claims**

1. Process for purifying a phosphate containing waste water in which aluminum oxide is used as a sorption material, comprising: bringing the waste water into contact in a stirrer reactor, with stirring, with fine-grained aluminum oxide having a grain size range from 0.05 to 0.2 mm, and simultaneously blowing in a gas which is inert with respect to Al_2O_3 and phosphate ions.

4,230,566

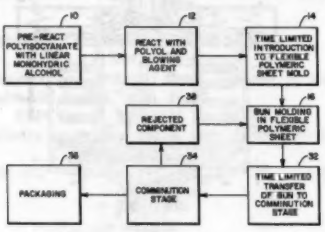
FOAMACEOUS HYDROCARBON ADSORPTION MEDIUM AND METHOD AND SYSTEM FOR MAKING SAME

Thomas L. Faudree, III, Mentor, Ohio, assignor to Petrozorbent Corporation, Zanesville, Ohio

Filed Jun. 28, 1978, Ser. No. 919,957

Int. Cl.² B01D *15/00*; C08G *18/14*; B29G *7/02*; B02C *18/44*

U.S. Cl. 210—693 **16 Claims**



15. A low density cellular polymer exhibiting a surface characteristic for adsorbing water-borne insoluble hydrocarbons, which polymer comprises the reaction product obtained by reacting in the presence of a blowing agent:

(a) a prepolymer which is the reaction product of:

(1) a polyisocyanate, and

(2) an alcohol selected from the group consisting of long chain monohydric alcohols of from about 8 to 12 carbon atoms per molecule and mixtures thereof, said alcohol being employed in an amount of about 10% to 25% of the stoichiometric amount required to react completely with the polyisocyanate; and

(b) a polyol present in a proportion developing a slight excess unreacted polyol to insure a complete reaction thereof with said polyisocyanate.

16. A method of removing oil from an oil-water mixture comprising contacting said oil-water mixture with the comminuted cellular product of claim 15 thereby selectively adsorbing said oil on said product.

4,230,567

PROCESS FOR WORKING UP EFFLUENTS CONTAINING NITRO-HYDROXY-AROMATIC COMPOUNDS

Wolfgang Larbig, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 6, 1979, Ser. No. 28,029

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818680

Int. Cl.² C02C *5/00*

U.S. Cl. 210—600 **4 Claims**

1. Process for treating an effluent containing a nitro- and hydroxy-group containing aromatic compounds which comprises heating said effluent containing said nitro- and hydroxy-group-containing aromatic compounds to a temperature in the range from 150° C. to 500° C. with exclusion of air and oxygen and under elevated temperature from 50 to 150 bars for 5 to 120 minutes.

4,230,568

TREATMENT OF HAZARDOUS WASTE

Christopher L. Chappell, Lichfield, England, assignor to Stablex A.G., Switzerland

Filed Oct. 19, 1978, Ser. No. 952,786

Claims priority, application United Kingdom, Oct. 19, 1977, 43507/77

Int. Cl.² C02C *5/02*

U.S. Cl. 210—751 **9 Claims**

1. A method of treating a liquid hazardous waste which may contain a significant proportion of an organic contaminant such method comprising the steps of adding to the liquid waste calcium-containing cement and an aluminium silicate or an alumino-silicate thereby forming a flowable slurry and thereafter allowing the slurry to set into a rigid rock-like mass and adding to the slurry an amount of active carbon sufficient to reduce to an acceptable level the leaching of the waste from the rock-like mass.

4,230,569

METHOD AND APPARATUS FOR SUPPLYING DISSOLVED CHEMICALS INTO WATER

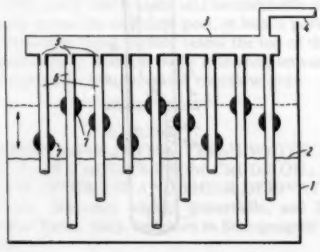
Karl Lohrberg; Rainer Pfohl, both of Heusenstamm; Jürgen Schubert, Obererlenbach, and Martin Gritschke, Karben, 1 Jachen Freytag, Usingen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1979, Ser. No. 28,026

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816522

Int. Cl.² C02B *3/08*

U.S. Cl. 210—754 **5 Claims**



5. A process for supplying a liquid containing available chlorine to a cooling water stream which comprises passing said stream along a generally horizontal path in a generally horizontally disposed conduit feeding said liquid containing available chlorine into a stationary, substantially horizontal manifold disposed above said stream which manifold is in fluid

communication with a plurality of vertically disposed discharge hoses of differing lengths each of which has an outlet opening disposed below the level of the cooling water stream said outlet openings being substantially evenly distributed throughout the cross-section of said water stream.

4,230,570

AERATOR

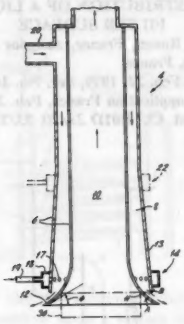
Stephen J. Irving, St. Albans, England, assignor to National Research Development Corporation, London, England

Filed Dec. 1, 1978, Ser. No. 965,438

Claims priority, application United Kingdom, Dec. 2, 1977, 50312/77

Int. Cl.[2] C02B 3/08; B01F 3/04

U.S. Cl. 210—758 **11 Claims**



1. An aerator apparatus including an aerator body having a pressure chamber, said pressure chamber having at one end thereof a first inlet for receiving a forced liquid along a selected direction, a wall opposite said first inlet, said wall being directed obliquely to said first inlet direction, a second inlet for a gas disposed between said first inlet and said opposite wall, a restricted chamber throat outlet fixedly directed away from the direction of said first inlet in the line of said oblique wall, the path between said first inlet and said throat outlet being unobstructed, the arrangement being such that liquid and gas supplied to the aerator produce a chamber outlet stream deflected from the first inlet direction of liquid and gas introduced therein to form bubbles in the outlet stream.

11. A method of aerating a volume of liquid, including drawing from the volume a supply of liquid, causing the supply of liquid to flow down a conduit into the volume of liquid along a full bore, unobstructed liquid path, causing the liquid flow to be diverted by a surface spaced obliquely across the conduit and restricting the conduit to an outlet throat fixedly directed away from the conduit direction, introducing gas into the liquid flow in the conduit in the region of the outlet throat but upstream of the outlet throat to emerge as a stream of liquid and bubbles of introduced gas with momentum provided by the liquid supply flow and directed by the oblique surface to carry the bubbles downwardly and outwardly in a liquid aerating sense.

4,230,571

OZONE/ULTRAVIOLET WATER PURIFICATION

Robert C. Dadd, 1320 Sumac Cir., Concord, Calif. 94521

Filed Jan. 22, 1979, Ser. No. 5,429

Int. Cl.[2] C02B 3/08

U.S. Cl. 210—760 **1 Claim**

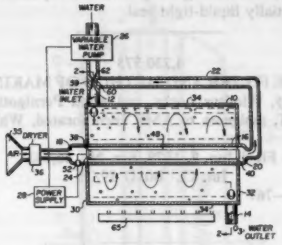
1. A method of purifying water which comprises the steps of:

generating relatively broad spectrum ultraviolet radiation;

directing air in a generally confined path through the radiation so as to produce ozone in the air;

introducing the ozone-containing air into the water to be purified; and

directing the mixture of water and ozone-containing air through the radiation in a generally helical path around



the source of radiation so as to extend the path length and thereby the duration of exposure of the mixture to the radiation, said generally helical path being outside of and isolated from the confined air path while the air is being simultaneously directed through the radiation.

4,230,572

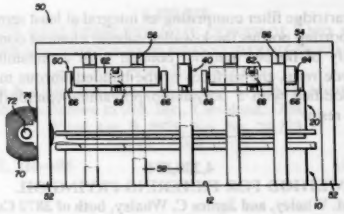
FILTER METHOD AND APPARATUS

Gene Hirs, 6865 Meadow Lake Dr., Birmingham, Mich. 48010

Filed Nov. 8, 1976, Ser. No. 739,755

Int. Cl.[2] B01D 37/00

U.S. Cl. 210—767 **22 Claims**



1. In a pressure filter assembly having a filter medium between relatively movable, aligned filter shells which respectively define receiver and discharge chambers in the assembly; the shells having opposed, aligned peripheral surfaces; with at least one of said shells carrying a compressible gasket on its peripheral surface for sealing the filter assembly during filtration; an influent passageway for supplying contaminant-carrying liquid under pressure to the receiver chamber; and an effluent passageway interconnected with the discharge chamber for receiving clarified liquid after its passage through the filter medium, upon which contaminants are accreted; the improvement of: displacement means for relatively displacing the filter shells (a) to place the shells in adjacent proximity for a filtration cycle, with the gasket compressed to seal the filter assembly (b) to compress the gasket prior to the initiation of a filtration cycle to an extent greater than that necessary to seal the filter assembly, and (c) to displace the shells from each other subsequent to a filtration cycle to accommodate the removal of the filtered solids; a fixed abutment surface spaced from one of said filter shells; and blocking means freely insertable between said one shell and the abutment surface when the displacement means has compressed the gasket to said greater extent, the dimension of said blocking means being slightly less than the corresponding dimension between said shell and the abutting surface when the gasket is compressed; said one shell being at least slightly displaced away from the discharge shell upon the introduction of liquid under pressure into the filter

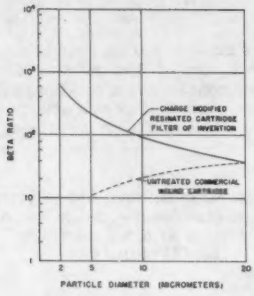
assembly for a filtration cycle, thereby (a) slightly reducing the compression on the gasket, (b) placing the blocking means in compression to resist the forces generated within the filter shells during filtration, which forces tend to separate the filter shells, and (c) maintaining the gasket in compression to maintain an essentially liquid-tight seal.

4,230,573

CARTRIDGE FILTER AND METHOD OF MAKING SAME

Michael Kilty, Windsor Locks, and Allan Pernigotti, Enfield, both of CT, assignors to AMF Incorporated, White Plains, N.Y.

Filed Jun. 8, 1979, Ser. No. 46,743
Int. Cl.³ B01D *39/16*
U.S. Cl. 210—767 **18 Claims**


BETA RATIO
CHARGE MODIFIED RESINATED CARTRIDGE FILTER OF INVENTION
UNTREATED COMMERCIAL MELBLE CARTRIDGE
PARTICLE DIAMETER (MICROMETERS)

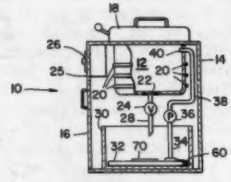
1. A cartridge filter comprising an integral at least semi-rigid self-supporting porous thick-walled tubular element consisting essentially of fibrous material bonded with a melamine-formaldehyde resin, the surfaces of the bonded fibrous material being modified with a polyamido/polyamine-epichlorhydrin cationic resin.

4,230,574

METHOD FOR FILTERING FRYING OIL

Bennie M. Whaley, and Janice C. Whaley, both of 3872 Concord Blvd., Concord, Calif. 95419

Filed Jan. 5, 1979, Ser. No. 1,293
Int. Cl.² B01D *37/02*
U.S. Cl. 210—778 **3 Claims**



1. In a deep fat fryer including only one cooking vessel for receiving cooking oil and food to be cooked; a drain opening at the bottom of said vessel; valve means for opening and closing said drain opening; a removable cover for closing off the top of said vessel; and heater means about said vessel for heating the cooking oil received therein, an improved method for batch filtering said cooking oil comprising the steps of:

(a) adding diatomaceous earth only to the heated oil in said cooking vessel;

(b) opening said valve means and draining said oil into a drain pan, said drain pan including a filter means positioned therein having a surface comprising a filter paper envelope of a porosity designed to trap said earth on said surface;

(c) drawing said oil through said filter means thereby causing said earth to be deposited on the surface thereof;

(d) returning said oil automatically to said vessel;

(e) opening said valve means and draining the heated oil into the drain pan such that said oil is deflected from splashing directly onto the surface of said filter means;

(f) drawing said oil through said filter means thereby filtering said oil;

(g) periodically returning said filtered oil automatically to said vessel; and

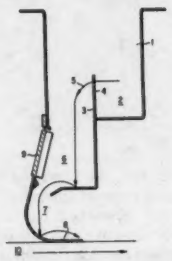
(h) repeating steps (e)–(g).

4,230,575

UNIFORM DISTRIBUTION OF A LIQUID OVER A FILTER SURFACE

Dominique Lizee, Rouen, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 22, 1979, Ser. No. 14,151
Claims priority, application France, Feb. 22, 1978, 78 05011
Int. Cl.² B01D *23/20, 33/38*
U.S. Cl. 210—780 **26 Claims**



1. A method for the uniform distribution of a liquid/solids feed to be filtered over a filter surface, comprising (i) initially, continuously introducing liquid/solids feed into the feeder compartment of a compartmentalized, partitioned feed-distribution box, said feeder compartment being dimensioned such that the volume for each unit length of the compartment progressively decreases away from the location of the introduction of the liquid/solids feed into the feeder compartment, (ii) continuing such feed as to effect an overflow of feed from said feeder compartment into a second, distribution compartment, over a common, partition wall member therebetween, via a plurality of outlet openings shaped into the top of said partition along the length thereof and being of a number such that a high rate of flow therethrough is assured, and (iii) thence uniformly cascading the overflow of liquid/solids stream onto suitable filter surface.

13. Apparatus for the uniform distribution of a liquid/solids feed over a filter surface, which includes a compartmentalized, partitioned feed-distribution box, comprising:

a feeder compartment having a bottom wall member, a pair of sidewall members, a back wall member, a front wall member defining an overflow weir and liquid/solids feed inlet means, the wall members of said feeder compartment being dimensioned such that the volume for each unit length of the compartment progressively decreases in a direction away from said liquid/solids feed inlet means; and

a distribution compartment having a back wall defined by said front wall member of said feeder compartment, a front wall member, a bottom wall member, a pair of sidewall members and an outlet opening for cascading feed flowing over said weir onto a filter surface.

4,230,576

METHOD OF CLEANING FILTER ELEMENTS THEREOF

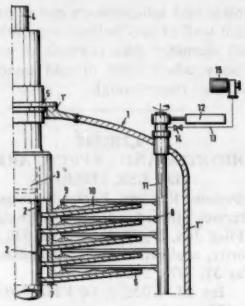
Hans Müller, Erlenbach, and Bruno Guazzone, Rapperswil, both of Switzerland, assignors to Chemap AG, Maennedorf, Switzerland

Continuation of Ser. No. 899,176, Apr. 24, 1978, abandoned. This application Feb. 13, 1979, Ser. No. 11,950

Claims priority, application Switzerland, May 9, 1977, 5738/77

Int. Cl.[3] B01D *29/38*

U.S. Cl. 210—797 7 Claims



1. A method of cleaning a circular filter element provided with a filtering material upon a surface of which a cake is deposited during a filtering process, comprising the steps of providing a nozzle means positioned over said cake; ejecting a cleaning fluid through said nozzle means; contemporaneously cyclically sweeping said nozzle means in a substantially circular arc defined by a first fixed point coincident with the periphery of said circular filter element, a second fixed point coincident with that portion of said cake nearest the central axis of said circular filter element and a third fixed point also coincident to the periphery of said circular filter element, and contemporaneously rotating said circular filter element about said central axis, said steps of ejecting, sweeping and rotating being sufficient to convert said cake into a slurry so as to provide substantially complete removal thereof from said circular filter element.

4,230,577

TANK FOR CLEANING AND CHEMICAL TREATMENT OF BOILER FEEDWATER

Earl J. Bennecke, and Mark R. Bennecke, both of 8249 S. Lockwood, Burbank, Ill. 60459

Filed May 4, 1979, Ser. No. 36,077

Int. Cl.[3] B01D *35/00*

U.S. Cl. 210—85 3 Claims

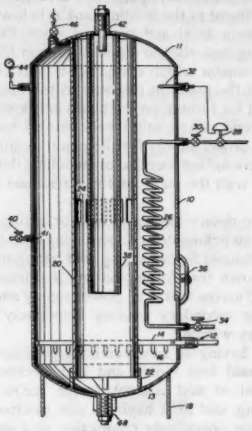
1. An apparatus for heating, chemical-mixing and cleaning boiler feedwater comprising:

(a) an upstanding tank having closed top and bottom with an outlet centrally located in the top thereof;

(b) an outer standpipe having an open bottom within said tank depending from the top thereof, said outer pipe depending a greater length from the top of the tank and having weir slots in its wall midway up the length of the tank;

(c) an inner open-bottom standpipe substantially concentric within said outer standpipe depending a lesser length from the top of the tank and opening at its bottom below the weir slots in the outer standpipe;

(d) a distributive inlet means within the tank adjacent to the bottom of the same above the bottom of said outer standpipe below the weir slots therein wherein the distributive inlet means comprises a circumferential tube adjacent to the inside of the wall of the tank having a plurality of spaced nozzles mounted therearound in fluid communication therewith and directed toward the bottom of the tank; and



(e) chemical input and heating means between the outer standpipe and the wall of the tank below the level of the weir slots with drain means centrally located in the bottom of the same.

4,230,578

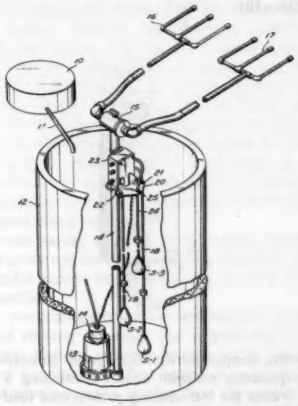
SEWAGE EFFLUENT VOLUME CONTROL AND ALARM ARRANGEMENT FOR PRESSURIZED SEWAGE DISPOSAL SYSTEM

Richard E. Culp, Eastlake, and Robert G. Baker, Mentor, both of Ohio, assignors to Jet, Inc., Cleveland, Ohio

Filed Apr. 9, 1979, Ser. No. 28,223

Int. Cl.[3] C02C *1/00*

U.S. Cl. 210—86 19 Claims



1. In a sewage disposal system for passing effluent from a septic tank to a disposal field, said system having:

a holding tank operatively connected to the septic tank to receive effluent therefrom;

a pump for discharging effluent from the holding tank to a disposal field;

an electric motor driving said pump;

a first switch operatively arranged to be closed while the

effluent in the holding tank is above a predetermined minimum level and to open when the effluent drops below said minimum level;

and a second switch operatively arranged to be open while the effluent in the holding tank is below a predetermined maximum level and to close when the effluent in the holding tank rises to a said maximum level;

the improvement which comprises a level control circuit for turning off the pump in response to the opening of said first switch and for turning on the pump in response to the closing of said second switch, said level control circuit including:

an A.C. power supply for the pump motor;

a bidirectional semiconductor switching device connected in series with the pump motor across said A.C. power supply;

a control device having means for gating on said bidirectional switching device and having an electrically energizable element for activating said gating means;

a step-down transformer having a primary winding connected across said A.C. power supply and having a lower voltage secondary winding inductively coupled to said primary winding;

an SCR having an anode-cathode path connected in series with said first switch and said electrically energizable element of said control device across said secondary winding, said SCR having a gate electrode;

and means operatively connecting said second switch between said secondary winding and said gate electrode of said SCR to turn on the SCR and thereby energize said electrically energizable element of said control device in response to the closing of said second switch;

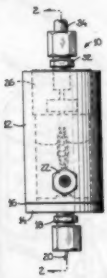
said SCR, after being turned on, being operative to stay on independent of said second switch as long as said first switch remains closed.

4,230,579

BRINE FLOW CONTROL FOR MEMBRANE SEPARATION SYSTEM

Donald T. Bray, Escondido, and Raymond A. Tondreau, San Marcos, both of Calif., assignors to Desalination Systems, Inc., Escondido, Calif.

Filed Jan. 10, 1979, Ser. No. 2,353
Int. Cl.[3] B01D *13/00*
U.S. Cl. 210—101 **5 Claims**



1. A reverse osmosis purification system comprising in combination a pressure resistant vessel containing a membrane cartridge, means for introducing pressurized feed liquid into said pressure resistant vessel, means for conducting permeate passed through said membrane out of said pressure resistant vessel and into a container, and a proportioning flow control for controlling the brine release from said pressure resistant vessel containing said membrane cartridge and for controlling pressure of permeate passed through said membrane and stored in said container under elevated pressure, comprising, an elongated small diameter duct formed of two portions, one open end of each of said small diameter duct portions communicating with a space within a common compartment, and means including a relief valve, for connecting said space within said common compartment to said container for storing said permeate, said relief valve normally closed to flow from said container for storing said permeate; in which the improvements comprise;

a. said common compartment comprising a pressure resistant hollow body separate from said pressure resistant vessel containing said membrane cartridge;

b. each of said small diameter duct portion passing through a wall of said hollow body and having an open interior end communicating with said space within said hollow body; and,

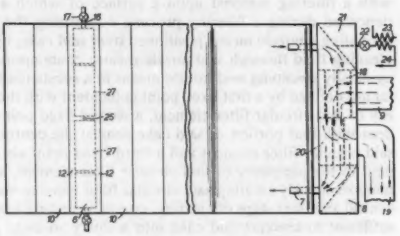
c. means inside said hollow body and in part contained by the bottom wall of said hollow body for sealing each of said small diameter duct portions to said wall of said hollow body where each of said small diameter duct portions passes therethrough.

4,230,580

SLURRY DIGESTER AND CAPPING ARRANGEMENT FOR USE THEREIN

Christopher Dodson, Reading, England, assignor to Commonwork Enterprises Limited, Edenbridge, England

Filed Jun. 29, 1978, Ser. No. 920,202
Claims priority, application United Kingdom, Jun. 29, 1977, 27295/77; May 31, 1978, 27295/78
Int. Cl.[3] C02C *1/14;* **F24J** *3/02*
U.S. Cl. 210—170 **37 Claims**



1. A capping arrangement for an anaerobic slurry digester of substantially rectangular horizontal cross-section, the capping arrangement comprising:

a plurality of elongate capping members of inverted channel form of substantially semi-circular cross-section comprising wall members, including flange sections at their lateral margins, which, when said capping members are placed in side-by-side arrangement, define therebetween channels which are upwardly open, said capping members being formed with gas release outlets in upper regions thereof; and

ballast means comprising elongate tanks resting on said flange sections in said upwardly open channels, said ballast means being provided with means for supply of water thereto and removal of water therefrom.

wherein said capping members are connected to each other at their lateral margins in association with said ballast means, said capping members being so formed that the capping arrangement is capable of floating on a body of slurry while being held therein by said ballast means and being lifted therefrom by gas under pressure thereunder.

10. An anaerobic slurry digester, comprising:

a basin of substantially rectangular horizontal cross-section and having a substantially horizontal upper periphery and having a shoulder therearound below the upper periphery thereof;

inlet means for supply of slurry to said basin below said periphery;

sludge removal means for removal of sludge from said basin; and

a capping arrangement sized to lie within said basin with its outer margin adjacent the periphery thereof, disposed in an upper region of said basin, which capping arrangement comrises—

a plurality of elongate capping members of inverted channel form of substantially semi-circular cross-section comprising wall members, including flange sections at their lateral margins, which, when said capping members are placed in side-by-side arrangement, define therebetween channels which are upwardly open, said capping members being formed with gas release outlets in upper regions thereof, and

ballast means comprising elongate tanks resting on said flange sections in said upwardly open channels, said ballast means being provided with means for supply of water thereto and removal of water therefrom,

wherein said capping members are connected to each other at their lateral margins in association with said ballast means, said capping members being so formed that the capping arrangement is capable of floating on a body of slurry while being held thereon by said ballast means and being listed therefrom by gas under pressure thereunder, and wherein the endmost of said elongate tanks and the ends of each of said elongate tanks can rest on the shoulders of said basin.

4,230,581

CENTRIFUGAL SEPARATORS

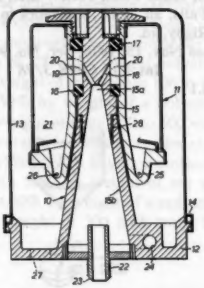
Rodney T. Beazley, Maidstone, England, assignor to The Glacier Metal Company, Limited, Middlesex, England

Continuation of Ser. No. 779,761, Mar. 21, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,461

Claims priority, application United Kingdom, Mar. 24, 1976, 11779/76

Int. Cl.[2] B01D *17/00*

U.S. Cl. 210—261 **2 Claims**



1. A centrifugal separator assembly comprising:

a cyclone having a generally conical hollow internal chamber and a vortex finder,

a stem having a lower end terminating at the conical end of said cyclone,

upper and lower bearings mounted on said stem, said lower bearing being substantially at the same height as a part of said cyclone chamber;

a centrifuge chamber mounted on said bearings and capable of rotation about said stem, said centrifuge chamber being axially oriented with respect to said cyclone and including a partition dividing the centrifuge chamber into upper and lower parts, the lower part being bounded by an inner wall which closely surrounds the outer side of the upper part of the cyclone wall, a substantial portion of the axial length of said cyclone being coextensive with at least one half of the axial length of said centrifuge chamber;

a first passage for leading fluid into said cyclone including a tangential inlet;

a second passage leading through the stem with an upward radial component from the apex of said generally conical cyclone chamber to an orifice formed in the rotary inner wall of said upper part of said centrifuge chamber;

a third passage leading from the upper to the lower part of the centrifuge chamber at the radial extremity of the partition;

means for creating a driving couple which comprises at least one orifice disposed in the lower part of the centrifuge chamber; and,

a fourth passage leading from said vortex finder to an outlet.

4,230,582

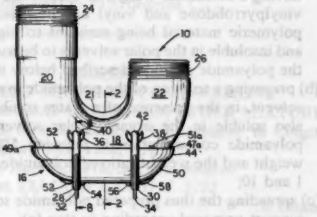
DRAIN TRAPS WITH STRAINER MEANS

Anthony Z. Tuleja, P.O. Box 1564, Sarasota, Fla. 33578

Filed Feb. 1, 1978, Ser. No. 874,221

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—311 **1 Claim**



1. A U-shaped pipe trap member comprising:

a U-shaped conduit comprising spaced vertical conduit sections and a horizontal section connecting the vertical conduit sections, the horizontal section having plural clamp receiving holes, and the horizontal section having an open bottom, the open bottom having a continuous lower rim portion with an annular groove,

U-shaped clamping members disposed transversely on the horizontal section, the clamping members having horizontal ends disposed in the holes of the horizontal section, and having bottom portions, the clamping members being pivotally held by the ends on said horizontal section,

a closure member comprising an upward opening bowl having an upper rim with an annular groove, the bowl having an inward extending annular ledge positioned inward of the upper rim, and the bowl having clamping member retaining members on an outside bottom of the bowl, each retaining member comprising an outward tapered rib, a stop spaced inward from the rib and a ridge between the rib and stop for receiving a bottom portion of a U-shaped clamping member,

sealing means having an ovate cross section disposed in the annular groove in the upper rim of the bowl for fitting into the annular groove in the lower rim portion of the horizontal section,

a strainer comprising a round vertical member having a first series of strainer openings and a generally rectangular horizontal strainer member having a rim and a second series of openings, the first series of openings in a said vertical member being smaller than the second series of openings in a said horizontal member, whereby particles not passing through the first openings pass through the second openings into the bowl, said strainer means being disposed in said bowl with the rim of the horizontal strainer member being disposed on the ledge of the bowl and the vertical strainer member extending downward into the bowl and upward into the horizontal section of the U-shaped conduit.

4,230,583

SUPPORTED ANISOTROPIC REVERSE OSMOSIS MEMBRANES BASED ON SYNTHETIC POLYAMIDES AND PROCESSES FOR THEIR PREPARATION

Antonio Chiolle, 44, Via V. Leati, Ferrara; Giuseppe Gianotti, 20, Via Rosmini, Novara, and Gianfranco Parrini, 46/9, Via della Moscova, Milan, all of Italy

Continuation of Ser. No. 708,969, Jul. 26, 1976, abandoned. This application Oct. 16, 1978, Ser. No. 951,365

Claims priority, application Italy, Jul. 30, 1975, 25908 A/75

Int. Cl.[2] C08J *3/16, 5/18*

U.S. Cl. 210—490 **16 Claims**

1. A process for preparing a supported anisotropic reverse osmosis membrane based on synthetic polyamides, said process comprising the following steps in the order given:

(a) preparing a support by treating a material suited for serving as a support for a polyamide membrane, with a water soluble polymeric material selected from the group consisting of polyacrylic acid having a molecular weight of about 50,000, methyl cellulose having a viscosity of 4000 cp au at 25° C., a copolymer of acrylamide and acrylic acid, polyvinylpyrrolidone, polyvinyl alcohol having a molecular weight of 14,000 and a copolymer of vinylpyrrolidone and vinyl acetate, said water soluble polymeric material being resistant to high temperatures and insoluble in the polar solvents to be used for preparing the polyamide solution described below in step (b);

(b) preparing a solution of the polyamide in an organic polar solvent, in the presence of a water soluble salt which is also soluble in the organic polar solvent, wherein the polyamide concentration is between 5% and 60% by weight and the weight ratio of polyamide/salt is between 1 and 10;

(c) spreading the thus prepared polyamide solution onto the support prepared according to step (a);

(d) partially evaporating the solvent by heating same at a temperature between 40° C. and 180° C. and for a time between 1 minute and 3 hours;

(e) coagulating the membrane in an aqueous medium to dissolve the water soluble polymeric material and remove it from said support; and

(f) thermally treating the thus obtained membrane.

4,230,584

LIQUID SEPARATING COMPOSITION AND APPARATUS FOR APPLYING SAID COMPOSITION

Toshizi Ichikawa, and Teruko Watanabe, both of Tokyo, Japan, assignors to Terumo Corporation, Himonya, Japan

Division of Ser. No. 843,950, Oct. 20, 1977, Pat. No. 4,172,803. This application Feb. 8, 1979, Ser. No. 10,484

Claims priority, application Japan, Oct. 21, 1976, 51-126688; Oct. 21, 1976, 51-126689; Jan. 8, 1977, 52-1094

Int. Cl.[3] B01D *21/26*

U.S. Cl. 210—516 **4 Claims**

1. An apparatus for applying a liquid-separating composition to a multiphase liquid substance which is to be separated into two phases by means of a centrifugal force of a predetermined magnitude and is contained in a container closed by an elastic stopper which apparatus comprises

a vessel having one end closed and being filled with a thixotropic liquid-separating composition having a specific gravity of from about 1.030 to about 1.065 which has been adjusted to be intermediate between those of the phases of the multiphase liquid to be separated, having a viscosity of from about 30,000 to about 2,500,000 CP at 20° C., and comprising a liquid polymer base material having a viscosity of from about 100 to about 20,000 CP at 20° C. selected from the group of liquid polybutadiene, liquid epoxidized polybutadiene and liquid maleinized polybutadiene, and a suitable amount of an additive for adjusting the specific gravity and the viscosity of the composition to the above ranges, and a thixotropic property-imparting amount of a network former;

and a cannula extending outward from the other end of the vessel, communicating with the interior of the vessel and having a sharpened tip portion which is to be inserted through the elastic stopper of the container as to mount the apparatus onto the container and provide a communication between the interior of the container and the vessel through which the liquid-separating composition is gradually transferable into the container upon application of the centrifugal force whereby the viscosity of the liquid-separating composition and the diameter of the cannula are adjusted such that the liquid-separating composition enters the container after sufficient separation of the phases of the multiphase liquid substance in the container has taken place.

4,230,585

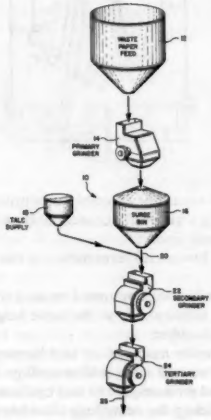
FIRE-RETARDANT CELLULOSE INSULATION AND PROCESS FOR MAKING SAME

Thomas O. Bird, Idaho Falls; Jack White, Rigby, and Carl H. Bird, Idaho Falls, all of Id., assignors to White-Bird Enterprises, Inc., Rigby, Id.

Filed Nov. 15, 1978, Ser. No. 961,088

Int. Cl.[2] C09K *3/28*

U.S. Cl. 252—8.1 **13 Claims**



1. A fire-resistant, cellulose insulation consisting of a finely divided cellulose intimately mixed with talc, the talc being present in an amount within the range on the order of about 5% to 25% by weight.

4,230,586

AQUEOUS WELL-DRILLING FLUIDS

John Bretz, Parma, and Leonard S. Cech, Wickliffe, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 7, 1978, Ser. No. 931,799
Int. Cl.[3] C09K 7/02
U.S. Cl. 252—8.5 P 19 Claims

1. An aqueous well-drilling fluid comprising (A) at least one non-Newtonian colloidal disperse system comprising:

(1) solid metal-containing colloidal particles having a unit particle size of from about 20 A to about 5,000 A consisting essentially of alkaline earth metal salts, said salts being characterized by having been formed in situ, at least a portion of which are predispersed in

(2) at least one organic liquid dispersing medium; and

(3) as an essential component, at least one organic compound which is soluble in said dispersing medium, the molecules of said organic compound being characterized by a hydrophobic portion and at least one polar substituent

and (B) a clay/water slurry and (C) at least one emulsifier effective for emulsifying said disperse system in said clay/water slurry.

4,230,587

ADDITIVE COMPOSITION FOR RELEASE OF STUCK DRILL PIPE

Clarence O. Walker, Richmond, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1978, Ser. No. 974,185
Int. Cl.[2] E21B 23/00
U.S. Cl. 252—8.55 R 10 Claims

1. An improved method of releasing a stuck drill string in the borehole of an underground formation during drilling operations employing an aqueous drilling fluid which comprises contacting said stuck drill string with an additive composition effective to reduce the annular pressure exerted by the drilling fluid against the stuck drill string and to release said stuck drill string, said additive composition being a member selected from the group consisting of 100% by weight polyethylene glycol having a molecular weight of from about 106 to 600; an admixture of from 25 to 50% by weight of a polyethylene glycol having a molecular weight of from 150 to 600 with from 75 to 50% by weight of saturated salt water; an admixture of 50% by weight of a polyethylene glycol having a molecular weight of from 300 to 600 with 50% by weight of sea water; and an admixture of 25% to 50% by weight of a polyethylene glycol having a molecular weight of 300 with from 75 to 50% by weight of sea water.

4,230,588

FUEL AND LUBRICANT ADDITIVES FROM AMINOALKYLALKANOLAMINES

Benedict R. Bonazza, and Sidney Schiff, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1978, Ser. No. 938,575
Int. Cl.[2] C10M 1/32, 1/38
U.S. Cl. 252—51.5 A 12 Claims

1. A method for producing detergent additives for lubricants and fuels comprising reacting fatty acid represented by the formula RCOOH in which R is a hydrocarbyl radical of about 7 to about 99 carbon atoms with aminoalkanolamine represented by the formula $H_{3-a}N(CH_2CH_2NR'CH_2CH_2OH)_a$ where R' is H or $CH_2CH_2NH_2$ and a is 1, 2, or 3.

4,230,589

METHOD FOR PRODUCING PIEZOELECTRIC CERAMICS

Toshio Ogawa, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 17, 1979, Ser. No. 67,419
Claims priority, application Japan, Aug. 17, 1978, 53-101213
Int. Cl.[2] C04B 35/46
U.S. Cl. 252—62.9 11 Claims

1. A method for producing piezoelectric ceramics of a $Pb(Sn_\alpha Sb_{1-\alpha})O_3$-$PbTiO_3$ system having a composition expressed by the general formula, $xPb(Sn_\alpha Sb_{1-\alpha})O_3$-$yPbTiO_3$, wherein subscripts α, x and y are mole fractions of the respective components and have the following values, $x+y=1.00$, $\frac{1}{4} \leqq \alpha \leqq \frac{3}{4}$, $0.01 \leqq x \leqq 0.40$, and $0.60 \leqq y \leqq 0.99$, which comprises, forming a powdered mixture of lead, tin, antimony and titanium compounds that correspond to said formula and which forms said composition at the firing temperature employed, calcining said mixture, forming said calcined mixture into a forming body and firing said body in an oxygen atmosphere containing not less than 80 volume percent of oxygen at a temperature of from 1000 to 1350 degrees C.

4,230,590

DETERGENT SOFTENER COMPOSITIONS CONTAINING A SOAP-CELLULOSE ETHER MIXTURE

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,532
Int. Cl.[2] C11D 1/65, 3/37, 3/22
U.S. Cl. 252—97 30 Claims

1. A detergent softener composition capable of imparting improved softness, detergency, antistatic and soil antiredeposition properties to fabrics treated therewith in a laundering process comprising by weight from about 9 to 40% of water soluble non-soap, organic surfactant, at least about 90% thereof being of the anionic type, from about 10 to 60% of water soluble, neutral to alkaline builder salt, from about 2 to 20% water soluble or dispersible fatty acid soap-cellulose ether mixture, from about 2 to 20% of cationic amine softener selected from the group consisting of (a) aliphatic di-(lower) C_1–C_4 alkyl, di-(higher) C_{14}–C_{24} alkyl quaternary ammonium salts (b) hetrocyclic compounds, and mixtures of (a) and (b), the weight ratio of soap to softener being from about 8:1 to 1:3 the percent concentration of anionic surfactant being at least about $1.5x+5$, x representing the percent concentration of softener, wherein the soap-cellulose ether mixture is substantially homogeneously dispersed in said composition as discrete particles.

4,230,591

PEROXYGEN BLEACHING AND COMPOSITIONS THEREFOR

Joseph H. Finley, Metuchen; Gaylen R. Brubaker, Lawrenceville, and Burton M. Baum, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 949,836, Oct. 10, 1978. This application Jul. 30, 1979, Ser. No. 61,574
Int. Cl.[2] C11D 3/395
U.S. Cl. 252—102 7 Claims

1. A bleaching composition consisting essentially a peroxygen bleaching compound and as a peroxygen activator therefor a N-sulfonylazole of the formula

where Z represents the number of carbon and nitrogen atoms necessary to complete a heterocyclic ring selected from the class consisting of pyrazole, pyrrole, triazole, and benzotriazole wherein said ring can be substituted with phenyl, alkyl of 1 to 10 carbon atoms, halogen, amino, cyano, nitro, alkoxy of 1 to 10 carbon atoms and R is an alkyl radical of 1 to 10 carbon atoms.

4,230,592

CONTROLLED FOAM DETERGENT ADDITIVE

Jack Miller, and Thomas C. Tesdahl, both of Cincinnati, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

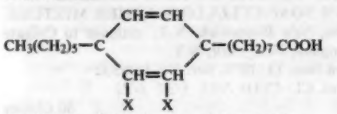
Filed May 31, 1979, Ser. No. 44,396

Int. Cl.³ C11D *7/06*

U.S. Cl. 252—156 **3 Claims**

1. Composition consisting essentially of:

Components	Wt. %
Water	6.0–86.95
Potassium hydroxide, dry basis	1.4–6.9
Amino tri methyl phosphonic acid, 40% active	2.0–10.0
100% active	0.8–4.0
Cycloaliphatic C_{21} dicarboxylic acid of the formula	0.5–8.0



in which one X is hydrogen and the other is a carboxylic acid group.

Sodium glucoheptonate or gluconate	5.0–35.0
Sodium nitrite	0.5–5.0
Linear alcohol alkoxylate, being an alpha alkyl hydroxypolyoxyethylene/oxypropylene cyclic polymer in which alkyl is C_{12-15}, oxyethylene content is 8–13 moles, oxypropylene content is 7–30 moles, average moles of ethylene oxide is 9, and average moles of propylene oxide is 15	0.05–5.0
Alkyl glucosides in which alkyl has 6–18 carbon atoms, 70% active	2.0–16.0
100% active	1.4–11.2

4,230,593

INORGANIC WATER-SOFTENING BEAD

Joseph E. Wagner, III, Newark, Del., and Lloyd E. Williams, Bel Air, Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 883,007, Mar. 3, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,390

Int. Cl.³ B01J *39/14;* C01B *33/28;* C02F *1/42;* C11D *3/12*

U.S. Cl. 252—179 **3 Claims**

1. A method of producing non-water dispersible water-softening beads comprising the steps of:

(a) adding from 80 to 90 parts of a sodium alumino silicate having a silica to aluminum oxide molar ratio of between 2:1 and 4:1 and a sodium oxide to aluminum oxide molar ratio of between 0.8:1 and 1.2:1 and from 10 to 20 parts of low density polyethylene to a disk pelletizer.

(b) heating the silicate and polyethylene to the softening point of the polyethylene while forming beads in the pelletizer;

(c) cooling the beads to below the softening point of the polyethylene;

(d) removing the cooled beads from the pelletizer; and

(e) screening the beads to obtain beads having a diameter of between 200 to 1000 microns and a calcium capacity of at least 200 mg calcium carbonate/g.

4,230,594

METHOD OF TREATING SPENT REDUCING GAS

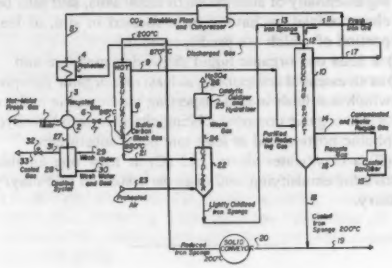
Heinrich Weber, and Kurt Tippmer, both of Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,311

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2727107

Int. Cl.² C10K *3/06;* C22B *5/00*

U.S. Cl. 252—188 **9 Claims**



1. A method of treating spent reducing gas which was spent in reducing iron ore comprising the steps of mixing the spent reducing gas with a fresh gas to replenish carbon monoxide and hydrogen and form a mixed gas of the type having substantially carbon monoxide, hydrogen sulfide and carbonyl sulfide, and directing an iron sponge in a counterflow heat transfer contact with said mixed gas at temperatures ranging from 700° C. to 1200° C. to partly desulfurize said mixed gas and to remove unreacted carbon from said mixed gas.

4,230,595

OXYGEN SCAVENGING AND HEAT-GENERATING COMPOSITIONS, AND DEOXYGENATING AND HEAT-GENERATING STRUCTURES

Teizo Yamaji, Yamaguchi, and Hiroyuki Okitsu, Iwakuni, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 6, 1979, Ser. No. 18,014

Claims priority, application Japan, Mar. 13, 1978, 53/27601; Mar. 16, 1978, 53/29217; Jun. 7, 1978, 53/67747; Aug. 3, 1978, 53/94092; Aug. 7, 1978, 53/95363

Int. Cl.² C09K *5/00, 15/02;* A23D *3/34, 5/04*

U.S. Cl. 252—188 **16 Claims**

1. An oxygen scavenger composition consisting essentially of

(a) metallic iron, and

(b) at least one oxidation promoter selected from the group consisting of sodium silicate hydrates, silicic acid, sodium alum and sodium borate hydrates, and optionally

(c) at least one oxidation promoter aid which is a metal halide compound, and/or

(d) a water-insoluble or sparingly water-soluble inert filler.

4,230,596

FAMILY OF LIQUID CRYSTALS OF THE DISUBSTITUTE DIESTER TYPE

Alain Beguin; Jean-Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

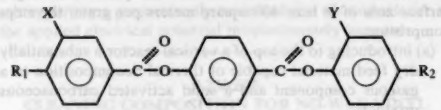
Filed Aug. 14, 1978, Ser. No. 933,564

Claims priority, application France, Aug. 17, 1977, 77 25180

Int. Cl.³ C07C *69/90, 121/60;* C09K *3/34*

U.S. Cl. 252—299 **10 Claims**

1. A liquid crystal compound of the formula



in which

R_1 designates an alkyl group or alkoxy group having n carbon atoms, n being an integer of 1 to 10;

R_2 designates an alkyl group having m carbon atoms, m being an integer of 1 to 10;

X designates bromine or the cyano group;

Y designates the methyl group.

8. A mixture comprising a liquid crystal compound of claim **1**, with p-pentylphenol-p-methoxybenzoate.

4,230,597

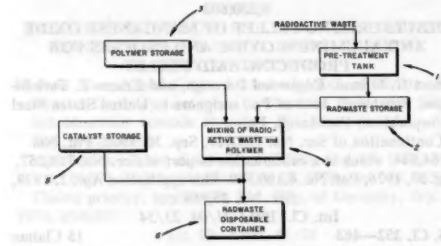
CONVERSION OF RADIOACTIVE WASTE MATERIALS INTO SOLID FORM

Thomas S. Bustard, and Corriene S. Pohl, both of Ellicott City, Md., assignors to Hittman Corporation, Columbia, Md.

Filed Aug. 3, 1978, Ser. No. 930,524

Int. Cl.[2] **G21F** *9/16*

U.S. Cl. 252—301.1 W **13 Claims**



1. A composition for forming homogeneous mixtures with radioactive waste materials which, when solidified, forms a solid rigid matrix which entraps said radioactive waste, said composition comprising from between about 30 to 48%, by weight, urea-formaldehyde, from between about 25 to 45%, by weight, methylated urea-formaldehyde; from between about 15 to 30%, by weight, urea and from between about 0.1 to 2.5%, by weight, plasticizer.

8. A process for converting radioactive waste materials into a free-standing solid form, said process comprising the steps of forming a homogeneous mixture of a liquid radioactive waste material with a polymeric composition comprising from about 30 to 48%, by weight, urea-formaldehyde; from between about 25 to 45%, by weight, methylated urea-formaldehyde; from between about 15 to 30%, by weight, urea and from between about 0.1 to 2.5%, by weight, plasticizer; contacting said mixture of said waste and polymeric composition with an acidic catalyzing agent to thereby solidify said mixture and to form a free-standing solid matrix of said polymeric composition which totally entraps said radioactive waste.

4,230,598

PHOSPHOR AND PROCESS FOR PREPARING SAME

Alain Vedrine, Clermont-Ferrand; Jean-Claude Gacon, Fontaines sur Saone; Georges Boulon, Lyon, and Danielle Trottier, Chamalieres, all of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly sur Seine, France

Filed Aug. 25, 1978, Ser. No. 936,867

Claims priority, application France, Aug. 29, 1977, 77 26779

Int. Cl.[3] **C09K** *11/46*

U.S. Cl. 252—301.4 H **6 Claims**

1. A divalent europium activated potassium yttrium fluoride phosphor which corresponds to the formula:

$$K_{(1-x)}\,Eu_x\,Y_3\,F_{10+x}$$

wherein x is positive and up to 0.06, the said phosphor emitting an intense monochromatic emission centered about 3585 Angstroms when excited by ultraviolet radiation at temperatures below 400° K.

4,230,599

PROCESS FOR INHIBITING FOAMING UTILIZING MALEIC ESTER COPOLYMER BASED DEFOAMERS, AND DEFOAMED COMPOSITIONS

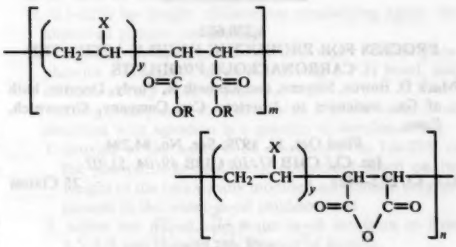
Gunther H. Elfers, Grosse Ile, Mich., assignor to The Diversey Corporation, Northbrook, Ill.

Filed Dec. 18, 1978, Ser. No. 970,263

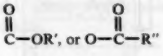
Int. Cl.[2] **B01D** *19/04;* **C09K** *3/00*

U.S. Cl. 252—321 **20 Claims**

1. A process for inhibiting foaming in a liquid system containing water comprising adding thereto an effective foam inhibiting amount of a defoamer composition consisting of a mineral oil and about 5 to about 50 percent by weight based upon the total weight of said composition of a mineral oil-soluble polymer of the formula:



wherein X equals hydrogen, alkyl of 1 to about 30 carbon atoms, phenyl, OR′,



wherein R′ is hydrogen or alkyl of 1 to about 30 carbon atoms, R″ is alkyl of 1 to about 30 carbon atoms; R is hydrogen or substituted or unsubstituted alkyl or alkyl ethers of about 8 to about 30 carbon atoms wherein at least one R is said alkyl, y is an integer of 1–5, and the sum of m and n are such that the polymer has a molecular weight of about 1000 to 100,000; the molar ratio of m:n being respectively about 50:50 to about 100:0.

11. A defoamed composition comprising a liquid system containing water and the defoamer composition of claim **1** dispersed therein as discrete particles present in an effective foam-inhibiting amount.

4,230,600

COMPOSITION FOR CONDITIONING SOFTWOOD LOGS PRIOR TO PEELING OPERATION

L. F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 758,908, Jan. 3, 1977, Pat. No. 4,108,226.
This application Apr. 7, 1978, Ser. No. 894,438
Int. Cl.[2] B01F *1/00*; C09K *3/00*
U.S. Cl. 252—364 3 Claims

1. A composition of matter for addition to softwood log soaking vats to improve the yield and grade of peeled veneer, said composition consisting essentially of from about 10 to about 50% by weight urea, a base selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate and ammonium hydroxide, said base being present in said composition in an amount sufficient to keep the pH of the water in said log soaking vats in the range of from about 6 to about 8 throughout the soaking period, and water.

4,230,601

CALIBRATOR COMPOSITION BASED UPON DIALYZED BLOOD SERUM

Doyle E. Hill, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1978, Ser. No. 902,605
Int. Cl.[3] C09K *3/00*; G01N *33/16, 31/14, 31/22*
U.S. Cl. 252—408 9 Claims

1. In a calibrator composition for use in calibrating an analytical system in which an aqueous albumin-containing liquid is assayed for one or more non-proteinaceous analytes contained therein by an indicator that binds to albumin having free sites, said composition comprising, in admixture

a pre-selected amount of such analytes and

a blood serum matrix comprising albumin having free-binding sites;

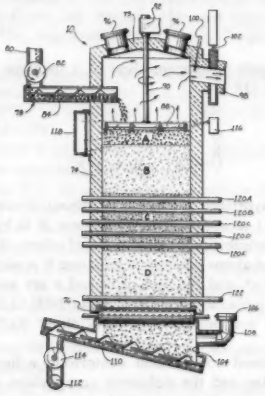
the improvement wherein said composition contains a compatible, organic, albumin site-binding material in an amount sufficient to reduce the bias arising from the presence of said free-binding sites.

4,230,602

PROCESS FOR PRODUCING HIGHLY ACTIVATED CARBONACEOUS PRODUCTS

Mack D. Bowen, Smyrna, and Kenneth R. Purdy, Decatur, both of Ga., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 12, 1979, Ser. No. 84,294
Int. Cl.[3] C01B *31/10*; C10B *49/04, 53/02*
U.S. Cl. 252—421 25 Claims



1. In a single-pass, self-sustaining, continuous process for the production of an activated carbonaceous product having a surface area of at least 400 square meters per gram, the steps comprising:

(a) introducing to the top of a vertical reactor a substantially dry feed material capable of thermal decomposition to a gaseous component and a solid activated carbonaceous product;

(b) substantially continuously moving said material, as a packed bed and at a predetermined rate, downwardly through and outwardly from the bottom of said reactor, while withdrawing gases upwardly therethrough and off-gases outwardly therefrom;

(c) injecting air into said bed at a multiplicity of levels which are vertically spaced from one another and from said top and bottom of said reactor, to establish a primary activation zone of substantial depth, said air being injected at said levels at significantly different rates independently controlled so as to distribute it, and to thereby render said primary zone substantially isothermal, with said material therein having a substantially uniform temperature of 1400° to about 2100° Fahrenheit;

(d) injecting low temperature steam, in the substantial absence of oxygen, into said bed at a location spaced downwardly from said primary zone, to establish a secondary activation zone of substantial depth below said primary zone, said steam being injected at a rate just adequate to transport sufficient thermal energy from said secondary activation zone to the top of said bed for drying and thermal decomposition of said material, to produce a temperature of about 250° to 600° Fahrenheit in said off-gases and to cool said material exiting from said secondary zone to a temperature of about 200° to 1500° Fahrenheit;

said exiting material comprising a substantially dry activated carbonaceous product having a surface area of at least 400 square meters per gram.

4,230,603

DESULFURIZING PELLET OF MANGANESE OXIDE AND ALUMINUM OXIDE AND PROCESS FOR PRODUCING SAID PELLET

Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 728,329, Sep. 30, 1972, Pat. No. 4,164,544, which is a continuation-in-part of Ser. No. 718,257, Aug. 27, 1976, Pat. No. 4,180,549. This application Apr. 2, 1979, Ser. No. 25,968
Int. Cl.[3] B01J *21/04, 23/34*
U.S. Cl. 252—463 15 Claims

1. A process for producing a pelletized desulfurizing agent for desulfurizing hot reducing gas comprising (1) intimately mixing finely divided manganese oxide and finely divided non-reactive aluminum oxide, (2) forming the thus prepared mixture into a pellet, and (3) heating the pellet to form a sintered, porous pellet consisting essentially of manganese oxide and aluminum oxide.

4,230,604

POLYMERIC ELECTRICAL CONDUCTANCE DEPENDENT UPON ELECTRICAL POTENTIAL

James A. Wingrave, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Oct. 30, 1978, Ser. No. 955,833
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—518 6 Claims

1. A method for imparting increased electrical conductance to organic resins and polymers comprising incorporating into said resins and polymers at least 0.007% by weight of an inorganic highly ionic monovalent metallic salt, 0.035% by weight of an inorganic highly ionic bivalent metallic salt or .07% by weight of an inorganic highly ionic trivalent metallic salt, said

salt imparting a geometrically increased rate of conductance as the applied electrical potential proportionately increases.

4,230,605

CLEANING COMPOSITION FOR NO-WAX VINYL COMPOSITION FLOOR COVERING

Arlene D. Connolly, Elizabethtown; James M. Eshleman, Manheim, and Edgar W. Knaub, Willow Street, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 13, 1978, Ser. No. 969,252

Int. Cl.[2] C11D *3/43, 3/37*

U.S. Cl. 252—545 **3 Claims**

1. A method of maintaining the high gloss of a vinyl composition floor covering having a no-wax coating comprising using as a cleaner a water diluted solution prepared from an aqueous cleaner consisting essentially of:

(a) an aqueous emulsion acrylic terpolymer containing about 51% by weight methyl methacrylate polymerized units, 31% by weight butyl acrylate polymerized units, and 18% by weight acrylic acid polymerized units;

(b) a mixture of 50% by weight of the reaction product of 1 mol coconut oil and 2 mols diethanolamine and 50% by weight of the reaction product of 1 mol dodecylbenzene sulfonic acid and 1 mol diethanolamine;

the ratio of solids being 85 to 75 parts (a) to 15 to 25 parts (b);

ethylene glycol monobutylether;

sufficient aqueous ammonia to provide a pH of greater than about 8.3;

and water;

said cleaner being diluted before use to give a solution having between about 0.1 to 0.5% by weight solids and 0.1 to 1.0 part by weight ethylene monobutyl ether per 100 parts water.

4,230,606

POLYOXYMETHYLENE MOLDING COMPOSITION CONTAINING MELAMINE FORMALDEHYDE POLYCONDENSATE

Herbert Amann, and Gerhard Morlock, both of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold -und Silber-Scheidearstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 715,802, Aug. 19, 1976, Pat. No. 4,139,575. This application Nov. 27, 1978, Ser. No. 963,729

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 2540207

Int. Cl.[3] C08L *61/28*

U.S. Cl. 260—6 **26 Claims**

1. In a molding composition comprising a polyoxymethylene, a melamine formaldehyde polycondensate as thermal stabilizer and an antioxidation agent, the improvement wherein said melamine formaldehyde polycondensate is a finely divided, cross-linked substantially water insoluble polycondensate comprising the precipitation product obtained by reacting formaldehyde, melamine and at least one other substance that can react to form a part of said polycondensate wherein the molar ratio of formaldehyde to melamine plus said other substance is between 1.2:1 and 10.0:1; up to 20 mole percent of said melamine being replaced with said at least one other substance that can react to form a part of said polycondensate; and said polycondensate is in an amount of about 0.001 to about 30 percent by weight, related to the total weight of said composition, said polyoxymethylene has a crystallite melting point of about 140° C. to about 180° C., a density of about 1.38 to about 1.45 g/ml (DIN 53 479), and a viscosity of at least about 30 ml/g when measured at 135° C. with a solution of 0.5 g polyoxymethylene in 100 ml dimethylformamide containing 2% by weight diphenylamine; said polycondensate has a primary particle size less than about 1 μm, and a specific surface up to about 250 m^2/g.

4,230,607

FASTER PROCESSING VINYL COMPOSITIONS

William A. Watts, Uniontown, and Mark D. Creekmore, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 16, 1978, Ser. No. 869,878

Int. Cl.[3] C08K *5/06, 5/10*

U.S. Cl. 260—23 XA **1 Claim**

1. A vinyl resin composition containing 100 parts of vinyl resin, 10 to 80 parts of plasticizer and in combination 0.5 to 50 parts of a partial ester of glycerine and an aliphatic, saturated or unsaturated, monocarboxylic acid containing 8 to 18 carbon atoms, 0.5 to 50 parts of a partial ester of sorbitan and an aliphatic, saturated or unsaturated, monocarboxylic acid containing 8 to 18 carbon atoms and 0.5 to 50 parts of a polyethoxylated alkyl phenol, where the alkyl group contains 8–12 carbons, with an average of 4–20 moles of ethylene oxide.

4,230,608

STABLE WATER-IN-OIL EMULSIONS OF CATIONICALLY MODIFIED QUATERNIZED POLYACRYLAMIDE AND THEIR METHOD OF PREPARATION

Lawrence A. Mura, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 22, 1978, Ser. No. 908,181

Int. Cl.[3] C08K *5/51*

U.S. Cl. 260—29.4 UA **9 Claims**

1. An improved process for the stabilization of water-in-oil emulsions of cationically modified acrylamide polymers of the type prepared by reacting an acrylamide polymer with formaldehyde and a secondary amine containing 2–8 carbon atoms followed by quaternization with an alkylating agent, said water-in-oil emulsion comprising:

A. 5–60% by weight finely divided cationically modified acrylamide polymer;

B. 5–75% hydrophobic oil;

C. 20–90% by weight water; and

D. 0.1–21% by weight oil-in-water emulsifying agent; the improved process comprising:

A. Preparing an aqueous solution of a water soluble phosphorous containing compound having a P-H bond, said solution having a pH of from 1.5–4.5;

B. Adding the aqueous solution of step A to the water-in-oil emulsion with agitation in a quantity to simultaneously:

1. provide to the water-in-oil emulsion from 1.6–25% of the phosphorous containing compound based on the weight of the cationically modified acrylamide polymer present in the water-in-oil emulsion; and

2. adjust the pH of said water-in-oil emulsion to from 3.5–5.0; and then, in the absence of heating,

C. Recovering a stabilized water-in-oil emulsion of the cationically modified acrylamide polymer, said water-in-oil emulsion being readily invertible when added to water in the presence of a hydrophilic surfactant, the polymer contained in the water-in-oil emulsion being stabilized against cross linking.

4,230,609

WATER REDUCIBLE COATING COMPOSITIONS

Gary L. Burroway, Doylestown, and Michael J. Maximovich, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 30, 1978, Ser. No. 910,806

Int. Cl.[3] C01D *5/00;* **C09D** *3/74, 3/80*

U.S. Cl. 260—29.6 TA **11 Claims**

1. A water reducible composition which comprises on a 100 parts resin basis an aqueous or solution dispersion of a defoamer, volatile components and a resin, said resin consisting essentially on a 100 weight percent basis of polymerized monomeric units, said units being obtained from polymerized monomers in the following percentages: 64.5 to 84.5 percent of a

hard hydrophobic enhancing units from monomers selected from the class consisting of styrene, α-methylstyrene, acrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride; 15 to 35 percent of soft hydrophobic enhancing units from monomers selected from at least one acrylate selected from the class consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, lauryl acrylate, isodecyl methacrylate, butyl methacrylate, isobutyl methacrylate, at least one vinyl ether selected from the class consisting of ethyl, butyl, octyl, decyl, and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said diene monomers are not mixed together and copolymerized with vinyl chloride or vinylidene chloride; and 0.5 to 10 percent of a hydrophilic enhancing organic acid unit selected from the class consisting of acrylic, methacrylic, fumaric, itaconic and maleic acid, said volatile components comprising a volatile amine in sufficient amount to result in a pH of from 8 to 14 for the composition; a water insoluble organic solvent; and a water soluble solvent selected from the class consisting of ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, diethylene glycol monoethyl ether acetate, diethylene glycol diethyl ether, ethylene glycol monomethyl ether acetate, dipropylene glycol methyl ether, methyl ethyl ketone, propylene glycol ethyl ether, propylene glycol isopropyl ether, propylene glycol butyl ether, acetone, methyl propyl ketone and diacetone alcohol; the water insoluble organic solvent having a weight ratio of from 70:30 to 20:80 relative to the water soluble organic solvent, and 0 to 30 parts of a plasticizer having a melting point of about −40° C. to about 25° C., a boiling point of at least 95° C., and a solubility parameter of about 8 to about 16, with the proviso that when water is present it is present in a volume ratio relative to the volatile components of at least 80:20.

4,230,610

POLYACRYLATE PIGMENT DISPERSANTS FOR MAGNESIUM OXIDE

Ronald J. Falcione, Canonsburg; Ronald R. McManis, Washington, and Joseph A. Aufman, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1979, Ser. No. 63,023
Int. Cl.³ C08L *33/02*
U.S. Cl. 260—29.6 M **1 Claim**

1. A method for reducing the slurry viscosity of magnesium oxide aqueous slurries which comprises maintaining in the slurry from 0.1 to 5.0 percent of a polyacrylic acid which has been neutralized to a pH of from about 8.0 to about 12.0.

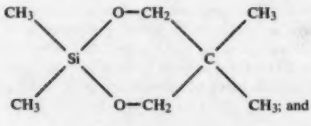
4,230,611

SILANE PLASTICIZED POLYCARBONATE COMPOSITION

Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1977, Ser. No. 865,296
Int. Cl.³ C08K *5/54*; C09L *68/00*
U.S. Cl. 260—29.15 B **4 Claims**

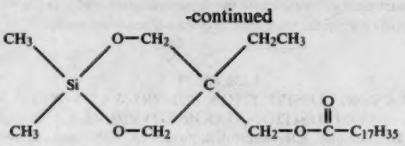
1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of a silane plasticizer of the following formulae:



(I)

and

-continued



(II)

4,230,612

POLYETHER LUBRICANTS FOR USE IN THE PROCESSING OF PLASTICS

Heinz Praetorius; Karl Seibert, both of Duren, and Werner Holtvoigt, Lonne-Riessel, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 860,508, Dec. 14, 1977, Pat. No. 4,159,975.
This application Jan. 11, 1979, Ser. No. 2,520
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656927
Int. Cl.³ C08G *65/08*; C08L *27/06*
U.S. Cl. 260—33.2 R **6 Claims**

1. A lubricant for use in processing thermoplastic polymers comprising a block copolymer comprised of blocks of polyalkylene oxide made from a monomer selected from the group consisting of aliphatic, non-substituted, 1,2-alkylene oxides containing from about 6 to about 40 carbon atoms, and mixtures thereof, and blocks of polyethylene oxide or polypropylene oxide, or mixtures thereof, the polyalkylene oxide being present in an amount of from about 10% to about 95%, by weight, based on the total weight of the block copolymer, and the block copolymer having an average molecular weight of from about 1,500 to about 10,000.

4,230,613

PEROXY-FREE METHACRYLATE LACQUER AND ADHESIVE METHOD EMPLOYING SAME

Leon E. Wolinski, Cheektowaga, and Peter D. Berezuk, Kenmore, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Filed Mar. 7, 1979, Ser. No. 18,161
Int. Cl.² C08K *5/05, 5/13*; C09J *5/00*
U.S. Cl. 156—315 **21 Claims**

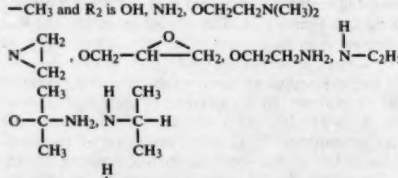
1. A peroxy-free lacquer composition for coating a substrate and serving as a vehicle for a peroxy catalyst activator, the activator-containing coating on the substrate being adapted to be brought into contact with an adhesive containing a peroxy catalyst,

the said lacquer composition comprising, in weight percent, copolymerizable monomers consisting of

(A) 65 to 98% of a monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate and styrene,

(B) 2 to 35% of an adhesion promoter selected from the group consisting of

wherein R_1 = H or $-CH_3$ and R_2 is OH, NH_2, $OCH_2CH_2N(CH_3)_2$



(C) 0 to 33% of a softening monomer selected from the group consisting of butyl acrylate and 2-ethyl hexyl acrylate,

at least one member of (A) and (B) respectively being present,

the said lacquer composition consisting of copolymers and any unreacted monomers,

(D) the said lacquer composition being dissolved in a volatile solvent to form a solution containing 20 to 40% lacquer composition, and

(E) an tertiary amine activator for a peroxy free radical polymerization catalyst dissolved in said solution in a ratio of activator: lacquer composition of 5:95 to 95:5.

4,230,614

STOP-OFF COMPOUND AND METHOD OF MAKING

Charles R. Arnold, and Donald A. Pennington, both of Seattle, Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Nov. 23, 1977, Ser. No. 854,452

Int. Cl.[2] C08K *3/38*

U.S. Cl. 260—33.6 PQ **4 Claims**

1. A stop-off composition as a parting agent during diffusion bonding of metals comprising: about 48 weight percent of a release agent of boron nitride dispersed in about 52 weight percent of a binder consisting of polyisobutylene dissolved in a solvent consisting essentially of an aliphatic or aromatic hydrocarbon to form a stop-off coating composition having a consistency to permit silkscreen application of the composition to a metal part to provide a coating having uniform thickness and sharply defined lines in intricate patterns.

4,230,615

PROCESS FOR CONTROLLED MIXING IN A HIGH INTENSITY MIXER

Zenas Crocker, Westmount, and Ved P. Gupta, Lasalle, both of Canada, assignors to Carlew Chemicals Limited, Montreal, Canada

Filed Nov. 21, 1978, Ser. No. 962,778

Int. Cl.[2] C08J *3/00*

U.S. Cl. 260—34.2 **16 Claims**

1. A process for controlled mixing of a mixable material in a high intensity batch mixer, comprising the steps of,

feeding a batch of the material into the mixer,

agitating the batch of the material in the mixer,

monitoring the infrared radiation produced by the batch of material so as to determine the temperature of the batch of material separately from the temperature of the mixer, and

discharging the batch from the mixer when the batch temperature reaches a final predetermined level.

4,230,616

FIRE-PROTECTING POLYESTER RESINS

Leo M. Godfried, Badhoevedorp, Netherlands, assignor to Fokker-VFW BV, Schiphol-Oost, Netherlands

Continuation of Ser. No. 303,781, Nov. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 9,987, Feb. 10, 1970, abandoned. This application May 11, 1978, Ser. No. 905,027

Claims priority, application Netherlands, Feb. 13, 1969, 6902243

Int. Cl.[3] C08K *5/03, 5/05, 5/17, 3/32*

U.S. Cl. 260—40 R **17 Claims**

1. In a fire-protecting moulding composition, the combination of:

35 to 50% by weight of an unsaturated polyester and 5 to 10% by weight of an unsaturated monomer copolymerisable therewith, together with a mixture of fire-protecting additives to render the moulding composition, when set, intumescent, said mixture consisting of:

5 to 20% by weight of a source of carbon having a high temperature of decomposition and containing many radicals capable of entering into an esterifying reaction with phosphoric acid,

20 to 40% by weight of a source of phosphoric acid having a decomposition temperature lower than that of said source of carbon whereby said esterifying reaction may take place at said decomposition temperature, and

5 to 20% by weight of a source of non-inflammable gases, said source providing said gases at temperatures above the decomposition temperature of said phosphoric acid source, all percentages being calculated on the combined weight of polyester and monomer fire-protecting additives.

4,230,617

SOMATOSTATIN ANALOGUES

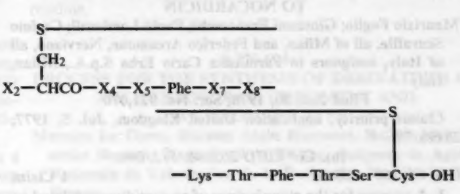
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,545

Int. Cl.[3] C07C *103/52;* C08L *37/00;* A61K *37/00*

U.S. Cl. 260—112.5 S **4 Claims**

1. A compound of the formula:



its linear precursor intermediates or non-toxic acid addition salts thereof in which

X_2 is NH_2, Ala-Gly-, Ala-D-Ala, Gly-Gly-Gly-, lower alkanoyl or benzoyl;

X_4 is Arg, His, D-Arg, or D-His;

X_5 is His, Tyr, Glu, D-His, D-Tyr, or D-Glu;

X_7 is Trp, Tyr, Met, or His;

and

X_8 is Trp or D-Trp.

4,230,618

AZO DYESTUFFS CONTAINING AN AMINO OR ACYLATED AMINO NAPHTHOL DI-SULFONIC ACID RADICAL AND AT LEAST ONE REACTIVE PHOSPHORIC OR PHOSPHONIC ACID GROUP

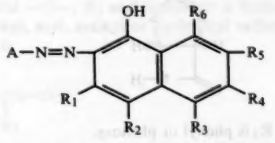
Donald R. Gauthier, Somerset, Mass., assignor to ICI United States, Inc., Wilmington, Del.

Filed Sep. 27, 1977, Ser. No. 837,625

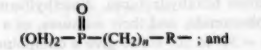
Int. Cl.[2] C09B *62/82;* D06P *1/384, 3/66*

U.S. Cl. 260—187 **13 Claims**

1. An azo dyestuff of the formula:



wherein A is a phenylene or naphthalene radical containing at least one phosphonic or phosphoric acid group having the formula:



; and

R is a phenyl or naphthyl radical, unsubstituted or substituted;

n is 0 or an integer of 1 to 4;

R_1 and R_2 are hydrogen or $—SO_3H$; and R_3–R_6 are hydrogen, $—SO_3H$, or NR_7Q wherein R_7 is hydrogen or lower alkyl and Q is hydrogen or an acyl group of 2 to 8 carbon atoms, at least two of R_1–R_6 being $—SO_3H$ and at least one being —NHQ, provided that when the dyestuff is monazo, then Q is a carbonyl group of 3 to 8 carbons and when the dyestuff is disazo, Q is hydrogen or a carbonyl group of 2 to 8 carbon atoms.

4,230,619
SYNTHETIC ROUTES TO AZETIDINONES RELATED TO NOCARDICIN

Maurizio Foglio; Giovanni Franceschi; Paolo Lombardi; Cosimo Scarafile, all of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

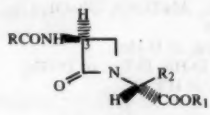
Filed Jun. 30, 1978, Ser. No. 921,070

Claims priority, application United Kingdom, Jul. 5, 1977, 28193/77

Int. Cl.[2] **C07D** *205/08, 513/04*

U.S. Cl. 260—239 A **1 Claim**

1. A process for the manufacture of an azetidinone related to nocardicin having the formula (I):



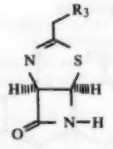
(I)

wherein R is a saturated or unsaturated alkyl having from 1 to 6 carbon atoms, α-aminobenzyl, benzyl, a free or substituted phenyl, the phenyl substituent being selected from hydroxy, methyl, methoxy, and amino;

R_1 is hydrogen, alkyl having from 1 to 4 carbon atoms, trimethylsilyl, trichloroethyl, benzhydryl, or benzyl; and

R_2 is a free or substituted phenyl, the phenyl substituent being selected from hydroxy, methyl, methoxy, and amino; comprising the steps of

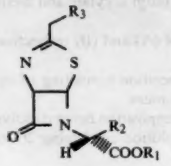
(a) reacting a compound of the formula (II):



(II)

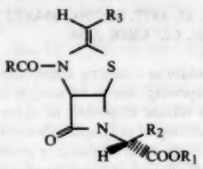
wherein R_3 is phenyl or phenoxy,

with a compound of formula $YCHR_2COOR_1$, in which Y is a leaving group selected from the group consisting of iodine, bromine, chlorine, acyloxy, and sulphonyloxy, and in which R_1 and R_2 have the meanings set forth above; in the presence of a metal hydride in a solvent selected from the group consisting of anhydrous tetrahydrofuran, dimethylformamide, hexamethylphosphoramide, and their mixtures, at a temperature ranging from −30° to 20° C., to give a compound of the formula (III):



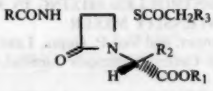
(III)

(b) N-acylating the compound of formula (III), with concomitant shifting of the double bond to the extra-nuclear position, by reaction with an acyl halide RCOX, where X is halogen and R has the meaning stated above, in the presence of an organic base or a saturated aqueous solution of $NaHCO_3$ in a two-phase system, thereby giving a compound of formula (IV):



(IV)

(c) hydrolytically cleaving the compound of formula (IV) by treatment with an aqueous solution of HCl in acetone, or by passing same through a silica gel column, thereby obtaining the 4-thioacyl derivative of formula (V):



(V)

(d) and reductively desulphurizing the compound of formula (V) with Raney-Ni to yield the azetidinone (I).

4,230,620
PROCESS FOR PREPARING PENICILLIN SULFOXIDES

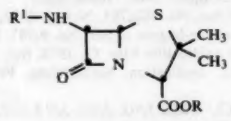
Ta S. Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 26, 1979, Ser. No. 23,875

Int. Cl.[3] **C07D** *499/04*

U.S. Cl. 260—239.1 **12 Claims**

1. A process for oxidizing a penicillin to a penicillin sulfoxide, said penicillin having the formula



in which R^1 is selected from the group consisting of phenoxyacetyl, benzoyl, thienyl-2-acetyl, phenylglycyl, and hydrogen; and R is selected from the group consisting of hydrogen, an alkali metal cation, and a carboxylic acid protecting group; which comprises contacting said penicillin in an aqueous medium at a temperature of from about 0° C. to about 50° C. with a peroxymonosulfate under conditions such that the pH of the resulting mixture is maintained within the range from about 2 to about 6.

4,230,621
STEROID DERIVATIVES AND THEIR USE IN RADIOIMMUNOASSAYS

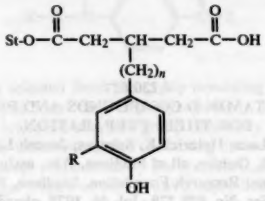
Jack Bernstein, New Brunswick; Ravi K. Varma, Belle Mead, both of N.J.; B. Richard Vogt, Yardley, Pa., and Frank L. Weisenborn, Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 824,016, Aug. 12, 1977, abandoned. This application May 1, 1978, Ser. No. 901,952

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—239.57 **20 Claims**

1. A steroid having the formula



wherein R is hydrogen or an alkyl group of 1 to 3 carbon atoms; n is 0, 1, 2, 3 or 4; and St is a des-hydroxy steroid moiety of (i) a hydroxy steroid intended for radioimmunoassay or (ii) a hydroxy containing derivative of a steroid intended for radioimmunoassay, said derivative having a strong affinity for the antibodies of the steroid intended for radioimmunoassay.

9. A steroid in accordance with claim 1 wherein St is a des-hydroxy derivative of a steroid selected from the group consisting of cholesterol, cortisol, cortisone, corticosterone, prednisolone, methylprednisolone, triamcinolone, betamethasone, dexamethasone, triamcinolone acetonide, betamethasone valerate, halcinonide, aldosterone, estrone, estradiol, estriol, testosterone, 19-nortesterone, methyltestosterone, pregnenolone, digoxigenin, digitoxigenin and 11α-hydroxyprogesterone.

4,230,622
HALOGEN DERIVATIVES OF CLAVULAIC ACID

Peter C. Cherry, Aylesbury; Gordon I. Gregory, Chalfont St. Peter, and Peter Ward, Northolt, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

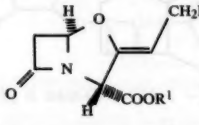
Filed Dec. 10, 1976, Ser. No. 749,368

Claims priority, application United Kingdom, Dec. 17, 1975, 51689/75; Jun. 25, 1976, 26594/76

Int. Cl.[3] E07D *498/04*

U.S. Cl. 260—245.3 **6 Claims**

1. A compound of the formula (II)



(II)

wherein Hal represents a chlorine, bromine or iodine atom and R^1 is selected from the group consisting of alkyl and alkenyl of up to 8 carbon atoms; alkyl and alkenyl of up to 8 carbon atoms having a substituent selected from the group consisting of methoxy, fluoro, chloro, bromo, iodo, cyano, acetoxy, pivaloyloxy, p-bromobenzoyl and carboethoxy; phenyl; benzyl; phenyl or benzyl having a substituted selected from the group consisting of chloro, o-nitro, p-nitro, cyano, p-methyl and p-methoxy; diphenylmethyl; triphenylmethyl; fur-2-ylmethyl; thien-2-ylmethyl; pyrid-4-ylmethyl; fur-2-ylmethyl, thien-2-ylmethyl or pyrid-4-ylmethyl substituted by lower alkyl on the heterocyclic group; a cycloalkyl group containing up to 12 carbon atoms; tetrahydropyranyl; phthalidyl; and a stannyl group, the tin atom having three substituents selected from the group consisting of C_{1-4} alkyl, phenyl, benzyl, phenyloxy and benzyloxy; or the E-isomer thereof.

4,230,623
PYRROLIDINE DERIVATIVES

Karl Bernauer, Oberwill; Karlheinz Pfoertner; Fernand Schneider, both of Basel, all of Switzerland; Hans Schmid, deceased, late of Schwerzenbach, Switzerland (by Käthe Anna Schmid-Appenzeller, heir); by Mary Margrith Baumann-Schmid, heir, Niedergösgen; by Maria Albertine Schmid-Suter, heir, Gränichen, both of Switzerland; by Jeannette Martha Wawrla-Schmid, heir, Nüziders, Austria, and by Ernst Georges Schmid-Gautschi, heir, Niedergösgen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 816,974, Jul. 19, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,352

Int. Cl.[3] C07D *207/44*

U.S. Cl. 260—326.5 SM **2 Claims**

1. 5-(p-methoxyphenyl)-2,2-dimethyl-3-(2-thienyl)-pyrrolidine.

2. Cis-5-(p-methoxyphenyl)-2,2-dimethyl-3(2-thienyl)-pyrrolidine.

4,230,624
PROCESS FOR THE SYNTHESIS OF DERIVATIVES OF THE BENZOFURAN, CHROMENE AND ISOCHROMENE TYPE

Maurice Le Corre, Rennes; Alain Hercouet, Betton, and Beatrice Begasse, Rennes, all of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly S. Sein, France

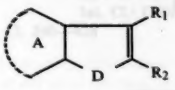
Filed Aug. 31, 1978, Ser. No. 938,653

Claims priority, application France, Sep. 2, 1977, 77 26686; Aug. 16, 1978, 78 23894

Int. Cl.[2] C07D *311/02, 307/79*

U.S. Cl. 260—345.2 **21 Claims**

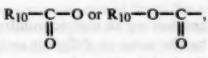
1. Process for the preparation of oxygenated heterocyclic compounds of Formula I:



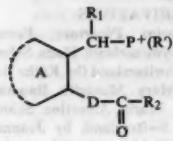
in which

represents a cycle of aromatic character, when D represents the radical —O—, R_1 and represents a hydrogen atom or a lower alkyl, aryl, aralkyl or cycloalkyl radical and, when D represents

R_1 and R_3 represent a hydrogen atom, or a lower alkyl, aryl, aralkyl, alkenyl, alkynyl, aralkenyl, aralkynyl, cycloaliphatic radical, R_{10}—O—,



wherein R_{10} is alkyl, alkenyl, alkynyl, aryl, aralkyl, aralkenyl, aralkynyl or cycloaliphatic radical and R_2 represents H or an organic radical, characterized in that a compound of Formula II:



in which R' represents an alkyl, aryl or aralkyl radical and X^- is an anion, is cyclized in the presence of a base in liquid phase.

4,230,625

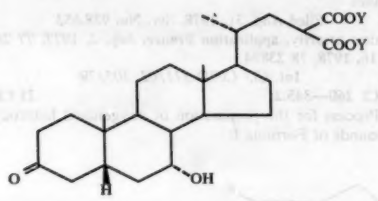
PROCESS FOR CHENODEOXYCHOLIC ACID AND INTERMEDIATES THEREFORE

Carl Despreaux, Cedar Grove; Thomas A. Narwid, Pompton Plains; Norberto J. Palleroni, North Caldwell, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 12, 1979, Ser. No. 29,420
Int. Cl.³ C07J 9/00, 5/00
U.S. Cl. 260—397.1 **15 Claims**

1. (5β)-24-Norcholane-3α,7α-diol-23,23-dicarboxylic acid.

4. A compound of the formula



where Y is C_{1-3}-alkyl.

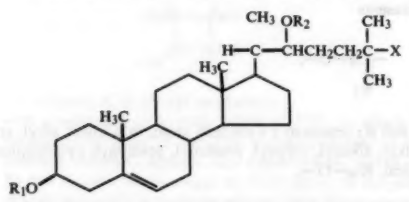
4,230,626

25-HALOCHOLEST-5-ENE-3β,22-DIOLS AND ESTERS THEREOF

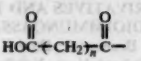
Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 30, 1979, Ser. No. 61,731
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.2 **5 Claims**

1. A compound of the formula



wherein X represents a halogen having an atomic number less than 53 and R_1 and R_2 may be the same or different and each represents hydrogen or a radical of the formula



in which n represents an integer from 1 to 3.

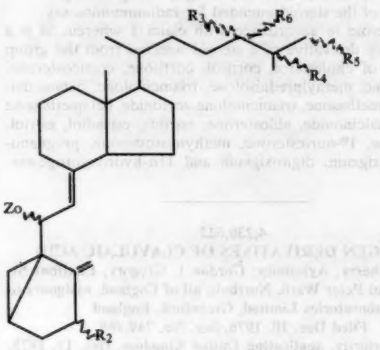
4,230,627

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

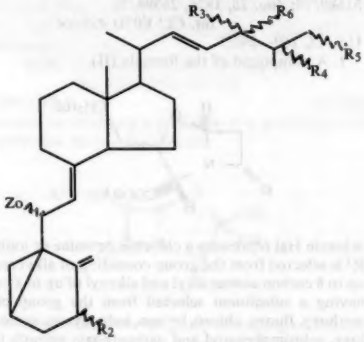
Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 928,279, Jul. 26, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 64,213
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.2 **5 Claims**

1. Compounds having the formula



or



where

Z is lower alkyl,

R_2 is fluoro,

R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, 0-lower-alkyl, 0-acyl, and fluoro, and

R_6 is hydrogen or lower alkyl.

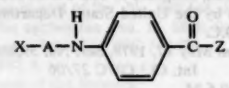
4,230,628

4-[(CARBOXYL- AND SULFAMYL-SUBSTITUTED ALKYL)-AMINO] BENZOIC ACIDS AND ANALOGS

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 12, 1978, Ser. No. 895,574
Int. Cl.[3] C07C *101/44*; C61K *31/245*
U.S. Cl. 260—404 5 Claims

1. A compound of the formula:



wherein X is selected from the group consisting of carboxy, lower alkoxycarbonyl and aryloxycarbonyl; A is an unbranched or branched alkylene group optionally saturated or mono- or poly-unsaturated, and containing or not containing a cycloalkyl group, represented by the formula $C_nH_{2(n-p)}$ with n being an integer from 8 to 18, inclusive, and p being an integer from 0 to 5, inclusive; and Z is selected from the group consisting of hydroxy, lower alkoxy, lower alkoxyalkoxy, di(lower alkyl)aminoalkoxy, (mono- or poly-hydroxy)lower alkoxy, allyloxy and substituted or unsubstituted benzyloxy; and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

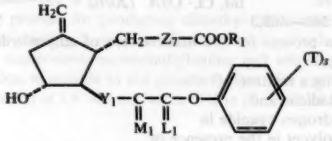
4,230,629

16-PHENOXY-9-DEOXY-9-METHYLENE-PGF COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 832,242, Sep. 12, 1977, Pat. No. 4,119,649, which is a division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 8, 1978, Ser. No. 941,095
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.[3] C09F *5/00, 7/00*; C11C *3/00*
U.S. Cl. 260—404 187 Claims

1. A prostaglandin analog of the formula



wherein Y_1 is trans-CH=CH—, —C≡C—, or —CH_2CH_2—;
wherein s is zero, one, two or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to three carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl, the various T's being the same or different;
wherein M_1 is

wherein R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of

and

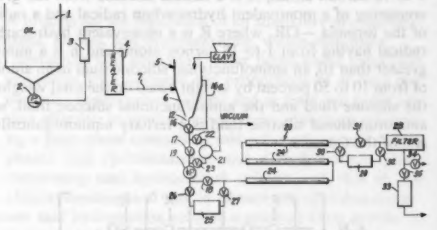
wherein R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein Z_7 is
(1) cis-CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—, and
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,
wherein g is one, 2, or 3; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,230,630

CONTINUOUS PROCESS AND APPARATUS FOR ADSORBENT BLEACHING OF TRIGLYCERIDE OILS

Theodore K. Mag, King City, and Margaret P. Reid, Don Mills, both of Canada, assignors to Canada Packers Limited, Canada

Filed Jul. 19, 1978, Ser. No. 926,071
Int. Cl.[2] C09F *5/10*; C11B *3/00*
U.S. Cl. 260—428 32 Claims



1. In a continuous process of bleaching oil with bleaching adsorbent, the improvement comprising:
preheating the oil to bleaching temperature in the range of approximately 70° C. to 180° C., continuously introducing the preheated oil to be bleached into a mixing vessel having an outlet in a lower region thereof in such manner as to cause the oil to swirl downwardly through said container, adding bleaching adsorbent containing moisture to said swirling oil whereby the oil and adsorbent are mixed in said vessel by the swirling movement of the oil and water is vaporized from the adsorbent and forms a protective atmosphere over the surface of the oil in the vessel to protect the heated oil from atmospheric oxidation, and withdrawing the mixture of oil and adsorbent from said vessel through said outlet.

4,230,631
PLATINUM COORDINATION COMPOUNDS

Paul C. Hydes, and Bernard W. Malerbi, both of Reading, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Oct. 17, 1978, Ser. No. 952,213

Claims priority, application United Kingdom, Oct. 19, 1977, 43492/77; May 18, 1978, 20461/78

Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 R **5 Claims**

1. A cis co-ordination compound of platinum having the structure

in which X and Y are the same or different ligands selected from sulphate, phosphate, nitrate, haloacetate and water or together comprise oxalato, succinato, glutarato, adipato, pimelato, malato or phthalato ligands and A and B are selected from the group consisting of isopropylamine, isobutylamine and isopentylamine coordinated to the Pt through their N atoms, such that the platinum is present as Pt^{2+}.

4,230,632
PREPARATION OF HEAT STABLE SILICONE FLUIDS

Dwain R. Chapman, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

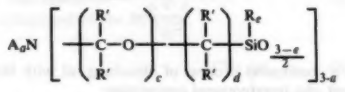
Filed Mar. 7, 1979, Ser. No. 18,215

Int. Cl.[3] C07F *7/08, 7/18*

U.S. Cl. 556—401 **8 Claims**

1. A method for preparing a heat stabilized silicone fluid which comprises adding to a silicone fluid having the general formula

in which R is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, X is a radical selected from the group consisting of a monovalent hydrocarbon radical and a radical of the formula —OR, where R is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms and n is a number greater than 10, an aminofunctional silicone fluid in an amount of from 10 to 50 percent by weight based on the total weight of the silicone fluid and the aminofunctional silicone fluid, said aminofunctional silicone fluid is a tertiary aminoorganosiloxane of the formula



where A is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, hydroxy terminated polyalkylenoxy groups, alkenyloxy terminated polyalkyleneoxy groups, hydroxyalkyl groups, tertiary aminoalkyl groups and divalent groups which together with the nitrogen atom forms a heterocyclic ring containing only carbon and nitrogen, with hydrogen as the only substituent on the ring or only carbon, nitrogen and oxygen with hydrogen as the only substituent on the ring, R is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R' is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, a is a number of from 0 to 2, c and d are each numbers of from 1 to 10 and e is a number of from 0 to 2, said tertiary aminoorganosiloxane is obtained from a platinum catalyzed addition reaction of an alkenyl ether of a tertiary hydroxyalkylamine and a silicon compound selected from the group consisting of silanes and siloxanes containing silicon bonded hydrogen.

4,230,633
NOVEL FISCHER-TROPSCH CATALYSTS

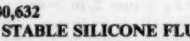
Kurt P. C. Vollhardt, Kensington, and Patrick Perkins, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1979, Ser. No. 39,986

Int. Cl.[3] C07C *27/06*

U.S. Cl. 260—449.6 M **7 Claims**

1. An improved Fischer-Tropsch process comprising contacting CO and H_2 at a temperature in the range of about 100° C. to 250° C. and a pressure of at least about 40 psi in the presence of a catalyst composition of the formula:



where:

(PS) represents a macroporous divinylbenzene crosslinked polystyrene in which the divinylbenzene crosslinking is greater than about 1%,

R represents a cycloalkadienyl radical of 4 through 6 carbon atoms;

Me represents a Group VIII metal;

CO represents a carbonyl radical;

H represents hydrogen;

n represents an integer varying from 0 through 3 and;

m represents an integer varying from 0 through 2, with the further provision that 2n+m must total 18 when added to the number of electrons in R and Me, or n+m must total 0.

4,230,634
MANUFACTURE OF ORGANIC NITRILES

Robert J. Benzie, and Dhafir Y. Waddan, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 884,548, Mar. 8, 1978, abandoned. This application May 21, 1979, Ser. No. 41,258

Claims priority, application United Kingdom, Mar. 28, 1977, 12916/77

Int. Cl.[2] C07C *120/02*

U.S. Cl. 260—465.3 **7 Claims**

1. In a process for the manufacture of adiponitrile which comprises:

(i) reacting a mixture of

(a) butadiene and

(b) hydrogen cyanide in

(c) a solvent in the presence of

(d) as catalyst a complex of a copper salt and an organic nitrile,

the catalyst being used in an amount of 0.0005 to 0.1 mole per mole of butadiene, the molar ratio of butadiene to hydrogen cyanide being 2:1 to 1:4 and the catalyst complex being formed by mixing the said copper salt with the said organic nitrile before or at the same time as it is mixed with the butadiene and hydrogen cyanide the temperature being within the range −25° C. to 200° C. to produce 3-pentenenitrile, and

(ii) reacting the 3-pentenenitrile produced in (i) with further hydrogen cyanide in the presence of a catalyst to give adiponitrile,

the improvement whereby there is used in (i) as solvent and sole nitrile complexing agent a di-nitrile selected from the group consisting of 3-methylglutaronitrile, a mixture of 3-methylglutaronitrile and 2-ethylsuccinidinitrile and a mixture

of adiponitrile, 3-methylglutaronitrile and 2-ethylsuccindinitrile.

4,230,635

SUBSTITUTED 4'-POLYHALOISOPROPYLSULFONANILIDES

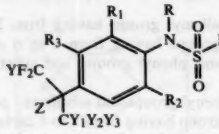
Bernard R. Neustadt, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 693,446, Jun. 7, 1976, abandoned. This application Aug. 15, 1978, Ser. No. 933,704

Int. Cl.[3] **C07C** *143/74*

U.S. Cl. 260—556 A **18 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, or a lower alkylsulfonyl group;

R_1 is hydrogen, lower alkyl, lower alkoxy, or halogen;

R_2 is hydrogen, lower alkyl, lower alkoxy, or halogen;

R_3 is hydrogen or lower alkyl, or R_1 and R_3 together complete an aromatic fused hydrocarbon ring;

R_4 is lower alkyl;

Y, Y_1, Y_2, and Y_3 are independently hydrogen, chlorine or fluorine; and

Z is hydrogen, chlorine, fluorine, or hydroxy.

4,230,636

PROCESS FOR PRODUCING DIMETHYL FORMAMIDE

Masao Saito; Tetsuo Aoyama; Shigeru Horie, and Kazuo Takada, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 917,894

Claims priority, application Japan, Jun. 24, 1977, 52-75246

Int. Cl.[3] **C07C** *103/36*

U.S. Cl. 260—561 R **14 Claims**

1. The process for producing dimethyl formamide which comprises reacting a mixture of methyl amines including as essential components monomethylamine and trimethylamine with carbon monoxide in the presence of an iron carbonyl at concentration of 5.5–300 mg- atom of iron per mole of reactant amine.

4,230,637

PROCESS FOR THE PREPARATION OF CHLORINE-SUBSTITUTED AROMATIC AMINES

Jürgen Zander, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

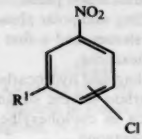
Filed Sep. 8, 1978, Ser. No. 941,098

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743610

Int. Cl.[2] **C07C** *85/11*

U.S. Cl. 260—580 **8 Claims**

1. In a process for the preparation of a chlorinated aromatic amine by contacting a chlorinated aromatic nitro compound of the formula



wherein R^1 and R^2 are identical or different and denote hydrogen or chlorine with hydrogen in the presence of a hydrogenation catalyst under a pressure at elevated temperature in the presence of a solvent and a small amount of a basic compound, the improvement wherein said basic compound is ammonia, said ammonia being present in an amount of from 0.2 to 5 parts by weight per 100 parts by weight of said chlorinated aromatic nitro compound and said hydrogenation catalyst is a platinum hydrogenation catalyst.

4,230,638

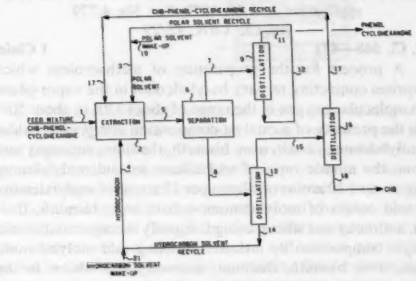
SEPARATION OF CYCLOHEXYLBENZENE FROM A CYCLOHEXYLBENZENE-CYCLOHEXANONE-PHENOL ADMIXTURE

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 4, 1979, Ser. No. 36,268

Int. Cl.[2] **C07C** *45/24, 7/01*

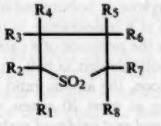
U.S. Cl. 568—366 **14 Claims**



1. A process for the separation of an admixture of cyclohexylbenzene, phenol, and cyclohexanone, which comprises:

(a) contacting said admixture under liquid-liquid extraction conditions with amounts and proportions of at least one nonpolar hydrocarbon solvent and at least one polar solvent effective to produce a two-phase admixture comprising a polar phase comprising said polar solvent and rich in phenol and cyclohexanone, and a hydrocarbon phase comprising said hydrocarbon solvent and rich in cyclohexylbenzene and lean in phenol and cyclohexanone.

wherein said hydrocarbon solvent is selected from acyclic or cyclic saturated hydrocarbons of 5 to 25 carbon atoms per molecule and said polar solvent is:


(I),

or mixtures of (I) or (II) with water, wherein each of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, is hydrogen or an alkyl radical of 1 to 10 carbon atoms per radical, and wherein n is an integer of 2 to 5,

(b) phase separating said two-phase admixture into said polar phase and said hydrocarbon phase,
(c) fractionally distilling said polar phase to produce a recycle polar solvent stream, and a first recovery stream of phenol and cyclohexanone,
(d) fractionally distilling said hydrocarbon phase to produce a recycle hydrocarbon solvent stream, and a second recovery stream rich in cyclohexylbenzene, and lean in phenol and cyclohexanone,
(e) fractionally distilling said second recovery stream to produce a stream of cyclohexylbenzene product, and a recycle stream of residual cyclohexylbenzene, phenol, and cyclohexanone for recycle to said liquid-liquid extraction step,
(f) recycling said recycle polar solvent stream to said contacting step (a),
(g) recycling said recycle hydrocarbon solvent stream to said contacting step (a), and
(h) recycling said residual stream of cyclohexylbenzene, phenol, and cyclohexanone to said contacting step (a).

4,230,639

PROCESS FOR THE PREPARATION OF METHACROLEIN

Sargis Khoobiar, Kinnelon, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 547,633, Nov. 1, 1977, Pat. No. 4,087,382, which is a division of Ser. No. 744,657, Nov. 24, 1971. This application Jan. 19, 1979, Ser. No. 4,779

Int. Cl.³ C07C *45/29*

U.S. Cl. 568—471 **1 Claim**

1. A process for the preparation of methacrolein which comprises contacting tertiary butyl alcohol in the vapor-phase with molecular oxygen in the range of about 330° to about 500° C. in the presence of a catalyst composition comprising oxides of molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon, the atomic ratio of said silicon to said molybdenum being at most 20 atoms of silicon per 12 atoms of molybdenum, and said oxides of molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon being integrally incorporated in said catalyst composition by intimately mixing said molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon in the preparation of said catalyst composition.

4,230,640

PROCESS FOR THE PREPARATION OF ACROLEIN AND METHACROLEIN

Sargis Khoobiar, Kinnelon, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 744,657, Nov. 24, 1976, Pat. No. 4,087,382. This application Nov. 1, 1977, Ser. No. 847,633

Int. Cl.² C07C *45/16*

U.S. Cl. 568—477 **3 Claims**

1. A process for the preparation of acrolein or methacrolein which comprises oxidizing an olefin consisting essentially of the corresponding propylene or isobutylene in the vapor-phase with molecular oxygen at a temperature in the range of from about 330° to 500° C. in the presence of a catalyst composition comprising oxides of molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon, the atomic ratio of said silicon to said molybdenum being at most 20 atoms of silicon per 12 atoms of molybdenum, and said oxides of molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon being integrally incorporated in said catalyst composition by intimately mixing said molybdenum, cobalt, iron, bismuth, thallium, antimony and silicon in the preparation of said catalyst composition.

4,230,641

HYDROFORMYLATION OF OLEFINS

Charles M. Bartish, Bethlehem, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 21, 1977, Ser. No. 853,343

Int. Cl.³ C07C *49/50*

U.S. Cl. 568—454 **9 Claims**

1. In a hydroformylation process, wherein a $C_{2\text{-}20}$ monounsaturated alpha-olefin, carbon monoxide, and hydrogen are reacted in the presence of a catalyst comprising a complex of a phosphine ligand and rhodium to produce normal straight chain and iso saturated aldehyde isomers, at a pressure from 100–1,000 psi, the improvement for producing a high normal-/iso isomer ratio and without forming sparingly soluble catalyst complexes, which comprises effecting said reaction in the presence of a catalyst comprising a complex of a rhodium compound and chelating phosphine ligand, the chelating phosphine ligand being represented by the formula: $R_1 R_2 P A P R_3 R_4$ wherein:

R_1 and R_3 are alkenyl groups having from 2 to 6 carbon atoms, alkyl groups having from 1 to 6 carbon atoms, hydrogen atoms, phenyl groups, and substituted derivatives thereof;

R_2 and R_4 are phenyl groups and substituted phenyl groups;

A is an alkenyl group having from 2 to 4 carbon atoms; and $(CH_2)_n$ wherein n is from 2 to 10 and substituted derivatives thereof; and

the molar ratio of said ligand to rhodium is from about 0.6–1.2:1 provided that where A is $(CH_2)_n$ and n is from 5–10, then the molar ratio is from 1–5:1.

4,230,642

PROCESS FOR PRODUCING 3,5-DICHLORO-α-METHYLSTYRENE

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kusatsu; Yasuhiro Tsujii, Kusatsu, and Itaru Shigehara, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Limited, Osaka, Japan

Filed Feb. 2, 1979, Ser. No. 9,178

Claims priority, application Japan, Feb. 27, 1978, 53-21812

Int. Cl.² C07G *25/00*

U.S. Cl. 570—193 **3 Claims**

1. A process for producing 3,5-dichloro-α-methylstyrene which comprises a step (a) of reacting magnesium with 1-bromo-3,5-dichlorobenzene in the presence of an ether solvent at a reaction temperature in a range of 10° to 70° C., wherein the amount of magnesium is in a range of 1 to 1.5 mole per mole of 1-bromo-3,5-dichlorobenzene; a step (b) of adding acetone to the reaction mixture at a temperature in the range of 0° to 70° C.; and a step (c) of adding a mineral acid to the reaction mixture to hydrolyze the resulting α-(3,5-dichlorophenyl) isopropoxymagnesium bromide at a temperature in a range of 0° to 100° C.; and then dehydrating the product at a temperature in a range of 80° to 120° C.

4,230,643

PROCESS FOR THE MANUFACTURE OF A VINYL ESTER COPOLYMER

Wilfried Eichhorn, Königstein, and Peter Seibel, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,333

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2748901

Int. Cl.³ C08F *263/04, 6/10*

U.S. Cl. 525—253 **6 Claims**

1. A process for the manufacture of a copolymer of at least one vinyl ester and crotonic acid which comprises copolymerizing 70% to 98% by weight of the total amount of vinyl ester with the total amount of crotonic acid in the presence of a radical-forming initiator and a polymerization regulator, adding the remainder of the vinyl ester to the polymerization

reaction mixture and completing the polymerization, mixing the polymer with an entrainer which is an alkanol of 1 to 4 carbon atoms that may contain up to 20% by weight of water and heating the resulting mixture to vaporize at least a part of said alkanol and thereby distill from said copolymer residual monomer and other volatile impurities.

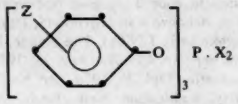
4,230,644

HALOGENATING REAGENTS

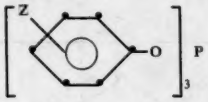
Lowell D. Hatfield, Bargersville; Larry C. Blaszczak, and Jack W. Fisher, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 1, 1979, Ser. No. 8,469
Int. Cl.³ C07F 9/14
U.S. Cl. 260—960 **15 Claims**

1. A halogenating compound of the general formula



which is the kinetically controlled product of the reaction of equivalent amounts of a triaryl phosphite of the formula



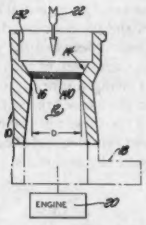
and chlorine or bromine in a substantially anhydrous inert organic solvent wherein in the above formulas Z is hydrogen, halo, C_1–C_4 alkyl or C_1–C_4 alkoxy, and X is Cl or Br.

4,230,645

INDUCTION PASSAGE STRUCTURE

Robert W. Dodson, Royal Oak, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,214
Int. Cl.² F02M 35/10
U.S. Cl. 261—19 **5 Claims**



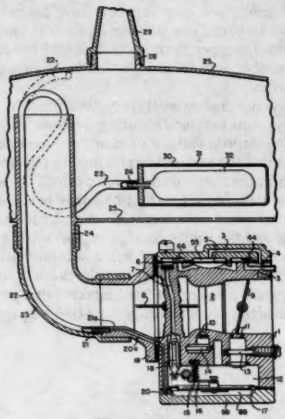
1. An induction passage structure, comprising body means, induction passage means formed through said body means, said induction passage means comprising venturi means, said venturi means comprising a venturi throat for the flow of fluid therethrough, said induction passage means having inlet and outlet means, said inlet means being disposed upstream of said venturi throat, said outlet means being disposed downstream of said venturi throat, and said venturi comprising generally converging venturi surface means situated adjacent and upstream of said venturi throat, said venturi surface means comprising a coined surface, and said coined surface defining an area less than the total area of said converging venturi surface means.

4,230,646

CARBURETOR DEVICE

Angiolino Ghizzoni, Bagnolo in Piano, Italy, assignor to Aquascooter, Inc., Springfield, N.J.

Filed Jan. 5, 1979, Ser. No. 2,041
Claims priority, application Italy, Jan. 30, 1978, 46809 A/78
Int. Cl.² F02M 17/04
U.S. Cl. 261—35 **5 Claims**



1. In a compensating membrane carburetor having a fuel accumulating chamber connected through conventional idling and high-speed jets to a Venturi upstream from which there is provided an air intake manifold, the improvement which comprises compensating chamber means maintained naturally or artificially at atmospheric pressure, second chamber means for sealing the external face of the compensating membrane from the environment of the carburetor and means partially disposed in the air intake manifold providing fluid communication between the compensating chamber means and the second chamber means to maintain the second chamber means at atmospheric pressure comprising flexible tube means in the air intake manifold having a free end that opens to the compensating chamber means.

4,230,647

CARBURETION

Ben Ingro, 2437 N. 73rd Ave., Elmwood Park, Ill. 60635

Continuation-in-part of Ser. No. 815,594, Jul. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 619,685, Nov. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,543, Apr. 12, 1974, abandoned. This application Feb. 26, 1979, Ser. No. 14,924
Int. Cl.² F02M 29/00
U.S. Cl. 261—78 R **5 Claims**

1. In combination with an air-fuel intake system for internal combustion engines comprising a downdraft carburetor which forms the only restricting device in the flow of the air-fuel mixture to the engine, said carburetor having an air-fuel outlet passage in its lower portion, a throttle valve disposed in said outlet passage for controlling the amount of finalized air-fuel mixture flowing to said engine, an intake manifold having an air-fuel passage therein which communicates with said carburetor outlet passage adapted to deliver said air-fuel mixture to said engine, and an intake valve and cooperating intake port disposed between said intake manifold passage and the combustion chamber of said engine, said intake manifold

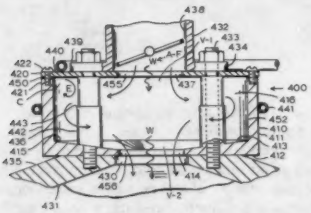
said upper inlet opening and said lower outlet passage in said air-fuel mixing chamber being substantially on the same vertical axis,

said air-fuel mixing chamber being adapted in one mode to cause an upper horizontally and radially extending divergence of flow of said air-fuel mixture in said mixing chamber as said mixture enters said mixing chamber through said upper inlet opening with said mixture being caused to turn downwardly at the perimeter of said mixing chamber, and further causing said air-fuel mixture to converge below the upper diverging flow to exit through the lower outlet passage in said mixing chamber and into said intake manifold passage,

said divergence and convergence flow pattern also being effective to cause any heavier liquid fuel particles to impinge on the upper floor surface of said lower horizontal wall member where said particles are evaporated from said surface,

said divergence and convergence flow pattern being minimized in another mode during periods of acceleration when the throttle valve is suddenly moved to a more open position and the vacuum in said mixing chamber is caused to drop appreciably during said periods of acceleration, the flow path in said mixing chamber being substantially and unrestrictedly "straight through" between the inlet opening and the outlet passage of said mixing chamber,

said air-fuel mixing chamber being substantially devoid of any members therein which would cause divergence and convergence passage and said intake valve port comprising a substantially unrestricted air-fuel passage from said



carburetor outlet passage to said combustion chamber; wherein an air-fuel mixing chamber is provided in said intake manifold passage downstream of said throttle valve, said air-fuel mixing chamber including a substantially horizontally disposed upper wall member, said upper wall member having an air-fuel inlet opening which communicates with said carburetor air-fuel outlet passage, a substantially horizontally disposed lower wall member, said lower wall member having an air-fuel outlet passage communicating with said intake manifold air-fuel passage, said lower wall member having an upper floor surface which angles downwardly toward said air-fuel outlet passage for draining any residual liquid fuel into said intake manifold passage,

means for joining said upper and lower wall members at their perimeters to form a leakproof housing which encompasses said air-fuel mixing chamber,

said upper air-fuel inlet opening being substantially the same diameter as said outlet passage of said carburetor,

said lower air-fuel outlet passage of said mixing chamber being substantially the same diameter as said carburetor outlet passage,

the height of said mixing chamber between said upper inlet opening and said lower outlet passage of said mixing chamber being at least greater than the diameter of said upper inlet opening,

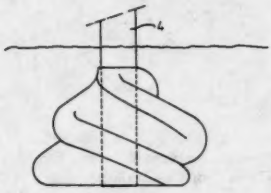
the width of said air-fuel mixing chamber being at least greater than the diameter of said upper inlet opening of said air-fuel mixing chamber, flow pattern, and having unrestricted air-fuel passages therein, and being devoid of functional elements therein other than structural members which would tend to obstruct the natural divergence and convergence flow pattern in said air-fuel mixing chamber,

the diameter of said upper inlet opening of said air-fuel mixing chamber being substantially the same size as the diameter of the carburetor air-fuel outlet passage downstream of said throttle valve, said upper inlet opening serving as a functional reference diameter, the horizontal cross-sectional area of said air-fuel mixing chamber at all horizontal levels being at least greater than the area of said reference diameter, and the height of said air-fuel mixing chamber between said inlet opening and said outlet passage being at least greater than said reference diameter.

4,230,648
ROTOR ADAPTED TO ROTATE ABOUT A ROTARY SHAFT

Frederik H. Leeuwrik, Lochem, Netherlands, assignor to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer (Nijverheidsorganisatie T.N.O.), The Hague, Netherlands

Continuation of Ser. No. 499,298, Aug. 21, 1974, abandoned.
This application Oct. 26, 1976, Ser. No. 735,453
Claims priority, application Netherlands, Aug. 22, 1973, 7311537
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—87 **6 Claims**



1. A rotor having a core part adapted to be rotated about an axis of rotation for displacing fluids, said core part carrying at least three continuous uniformly curved symmetrically-shaped helical ridges defining a continuous three-lobe cross section in radial planes along the length of the core part, said ridges defining three intermediate pits, said ridges blending into the core part to have the innermost portion of the pits coincident with the core part, the depths of each of the pits measured between the core part and a tangential line to two of said lobes, one on each side of the pit concerned, being at least equal to one-third of the distance between the core part and the maximum radius of said ridges, each of the three lobes in each radial section of the rotor being uniformly curved and symmetrical about a radius from the axis of the rotor to the distal point of the lobe and each of the three pits intermediate the lobes being uniformly curved and symmetrical about a radius from the axis of the rotor to the radially innermost part of the pit.

4,230,649
APPARATUS AND METHOD FOR CONTINUOUS TREAD PRODUCTION

George G. A. Bohm, Akron, Ohio, and Stanley S. Gross, Evans City, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 12, 1978, Ser. No. 908,345
Int. Cl.[2] B29H *17/36*
U.S. Cl. 264—22 **24 Claims**

1. A method for producing a continuous rubber strip with a surface design comprising the steps of:

extruding uncured rubber into a continuous strip at a temperature below its curing temperature;

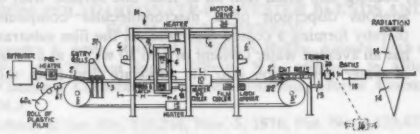
impressing a design on said continuous strip by passing said

strip between moving cooperating mold segments while impressing a high pressure of about 1000 psi to force the rubber into the design pattern of the mold at a temperature below the curing temperature of the rubber;

maintaining a lower pressure on said strip after the imposition of said high pressure while said strip remains between said cooperating mold segments;

removing the molded strip in the uncured state from between the moving mold segments; and

curing the rubber of the molded strip after removal from the mold segments.



4,230,650

PROCESS FOR THE MANUFACTURE OF A PLURALITY OF FILAMENTS

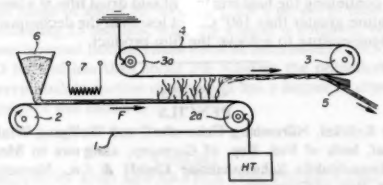
Claude Guignard, St-Genis, France, assignor to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 495,544, Aug. 7, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,422

Claims priority, application Switzerland, Aug. 16, 1973, 11793/73; Nov. 6, 1973, 15592/73; Dec. 12, 1973, 17380/73; Japan, Jan. 28, 1974, 49/1082

Int. Cl.³ B06B *1/02*; B05C *5/02*

U.S. Cl. 264—24 **12 Claims**



1. A process for the manufacture of a plurality of polymer fibers comprising,

forming a continuous layer of dielectric molten polymer is a mass having a broad exposed surface from which polymer fibers are to be electrostatically developed and electrostatically directly torn therefrom,

developing an electrostatic field between a first electrode and a second electrode spaced from the first electrode, the field consisting of lines of flux passing through a space between the two electrodes, and the first electrode being at a higher potential than the second electrode,

while in a plastic consistency of a viscosity such that it can be directly electrostatically drawn from said layer into fibers subjecting said molten polymer to said electrostatic field without flow of said layer so that the lines of flux pass through said layer and are substantially perpendicular to said broad surface of the molten polymer,

and maintaining said electrostatic field at an intensity effective to concentrate molten polymer molecules at discrete zones on said surface and agglutinate in said zones and are torn away due to the effect of said electrostatic field at said discrete zones from said exposed surface toward said second electrode along the lines of flux as molten polymer fibers that start to solidify and set during movement toward said second electrode.

4,230,651

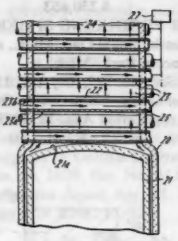
METHOD OF FABRICATING A HEAT EXCHANGER FOR STIRLING ENGINE

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 816,635, Jul. 18, 1977, Pat. No. 4,183,213. This application Dec. 26, 1978, Ser. No. 973,785

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—29.7 **4 Claims**



1. A method for fabricating a ceramic heater head for use in a Stirling engine, comprising:

(a) forming a ceramic slurry comprised of a binder and silicon filler powder, said binder consisting essentially of a mixture of a selected parafinic oil and a tri-block polymer with polystyrene end blocks, said oil being selected to prevent destruction of the cross links formed by the thermal plastic domains of said polymer and a boiling point range of 200°–400° F.,

(b) mixing said slurry at a temperature of 200°–300° F. to obtain a uniform mixture,

(c) forming said slurry into tubes having an internal diameter which is 5–6 times the tube wall thickness and into a dominant cylindrical chamber effective to operate as a hot chamber for said Stirling engine,

(d) heating said formed sheets in a carburizing atmosphere in steps: 200°–240° F. for four hours, 250°–275° F. for four hours, 350°–450° F. for four hours, 800° F. for four hours,

(e) perforating openings in the wall of said cylindrical chamber having a size effected to mate with outside diameter of said tubes,

(f) assembling said formed tubes to extend in parallel arrangement across the interior of said chamber having the ends of said tubes supported in said perforate openings of said walls,

(g) heating said assembly rapidly in a carburizing atmosphere, to 2000°, at a rate of 600°–800° F. per hour, and then to 2200° F.–2500° F. at a rate of 100° F. per hour.

4,230,652

METHOD OF REPAIRING A REFRACTORY STRUCTURE

Jim E. Allen, and Robert E. Farris, both of Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 20, 1978, Ser. No. 953,722

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 **4 Claims**

1. The method of repairing a refractory structure comprising:

(a) admixing (i) from 50 to 80% aluminosilicate aggregate, (ii) from 2 to 30% plastic clay, (iii) and from 10 to 20% graphite, the percentages being based on the total weight of the admixture;

(b) predampening said admixture with from 5 to 10% by weight of liquid sodium silicate containing from 45% to 65% of water;

(c) placing the predampened admixture in a gunning appara-

tus having an ejection nozzle adapted to admix water with a granular material passing through the nozzle;

(d) projecting the predampened admixture through the nozzle, while adding water thereto, onto the refractory structure; characterized in that the predampened admixture is substantially dust-free during subsequent handling and exhibits a potential shelf-life of up to six months when stored in a moisture sealed container.

4,230,653

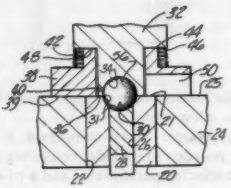
METHOD FOR PRODUCING SPHERICAL ARTICLES

Raymond P. DeSantis, Royal Oak, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Continuation of Ser. No. 787,109, Apr. 13, 1977, abandoned, which is a division of Ser. No. 619,855, Oct. 6, 1975, Pat. No. 4,047,864. This application Aug. 28, 1978, Ser. No. 937,179

Int. Cl.² B28B 7/04

U.S. Cl. 264—39 **8 Claims**



1. The method of compacting pressure moldable powder material in a mold into generally spherical articles which comprises filling by gravity with said powder material a first cavity in a first partial mold, said cavity having an open upper end, displacing a movable wall portion of said first cavity in said first partial mold during filling in a direction and to a predetermined position increasing the volume of said first cavity, leveling said powder material in said first cavity in said first partial mold to a level corresponding to the level of said open end of said first cavity, placing over the open end of said first cavity a second partial mold having a second cavity therein, said first and second partial molds having correspondingly engageable interfering faces preventing one of said partial molds from penetrating into the other, and said second cavity being disposed and aligned relative to said first cavity to form therewith a complete molding cavity of generally spherical shape, displacing said movable wall portion in a direction opposite to said first direction for decreasing the volume of said first cavity for transferring part of said powder material from said first cavity through said open end into said second cavity in said second partial mold for filling said complete molding cavity and applying pressure for compacting said powder material in said molding cavity defined by said first and second cavities for molding one of said articles, removing said second partial mold from over the open end of said first cavity, and further displacing said movable wall portion in said opposite direction for ejecting said molded article from said first partial mold through said open end of said first cavity.

4,230,654

METHOD OF CONCURRENTLY-BIAXIALLY DRAWING POLYVINYL ALCOHOL FILM

Mutsuo Kuga, Kyoto; Kiyoshi Kitagawa, Hirakata; Motoo Kawasaki, and Junkichi Watanabe, both of Kyoto, all of Japan, assignors to Unitika Limited, Amagasaki, Japan

Filed Jan. 31, 1979, Ser. No. 8,106

Claims priority, application Japan, Feb. 21, 1978, 53/19306

Int. Cl.² B29C 17/02; B29D 7/02

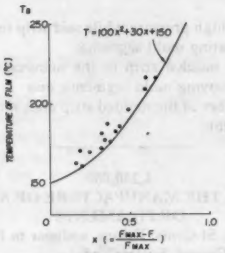
U.S. Cl. 264—134 **17 Claims**

1. A process for preparing a concurrently-biaxially drawn polyvinyl alcohol film, comprising the steps of:

(a) fabricating a molten, hydrated polyvinyl alcohol into a film;

(b) drying said film while preventing orientation of the film thereby obtaining a substrate film which is in a substantially non-oriented state and which has a water content of 3 to 20 wt. %;

(c) coating said dried film on at least one surface with an aqueous dispersion of a macromolecular compound thereby forming a coated film wherein the film substrate has an average water content of 5 to 30 wt. % as a result of water permeation into the substrate film from said



coating, the average water content of said substrate film increasing by 2 to 10 wt. % as a result of said water permeation;

(d) concurrently-biaxially drawing said coated film to achieve an area elongation of 600 to 1300%;

(e) heat treating said drawn film to relieve stress in said film and to dry said film to a water content of less than 3 wt.%; and

(f) continuing the heat treating of said dried film at a temperature greater than 160° C. but less than the decomposition temperature to achieve the film product.

4,230,655

PENCILS

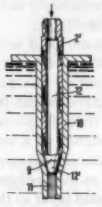
Peter Krückel, Nüremberg Gebersdorf, and Wolfgang Winkler, Lauf, both of Fed. Rep. of Germany, assignors to Messrs. Schwan-Stabilo Schwanhausser GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,322

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718957

Int. Cl.² B29D 3/00

U.S. Cl. 264—135 **7 Claims**



1. A method of making a pencil for cosmetic purposes that can be sharpened, comprising the steps of: preparing a tubular wooden shaft with an axial through-bore, coating the bore with a material, placing said shaft into a mold extending beyond one end of said axial through-bore, and casting a cosmetic stick composition into said bore from the other end of said through-bore so as to fill the space beyond said one end to form a point, said coating being made from a material adapted

to counter penetration of said wooden shaft by said cosmetic composition.

4,230,656

TRANSPARENT SHEETS AND CONTAINERS FORMED FROM POLYCARBONATE-POLYESTER BLENDS AND FORMATION THEREOF

Surendra A. Amin, Pottsville; Phillip S. Bollen, Auburn, both of Pa., and William Sacks, Gillette, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 739,214, Nov. 5, 1976, Pat. No. 4,123,473, which is a continuation-in-part of Ser. No. 625,299, Oct. 23, 1975, abandoned. This application May 15, 1978, Ser. No. 905,664

Int. Cl.³ B29F *3/08*

U.S. Cl. 264—171 **10 Claims**

1. A process of forming a sheet which comprises:

a. uniformly blending a composition comprising about 80 to 97% by weight polyethylene terephthalate having an intrinsic viscosity of above about 0.9 as measured in a mixed solvent of 60 parts by weight phenol and 40 parts by weight tetrachloroethane at 25° C., and a melt viscosity at 525° F. of about 10,000 poises with correspondingly about 20 to 3% by weight of a polycarbonate resin having an intrinsic viscosity of 0.4 to 0.6 as measured in dioxane at 30° C. and a melt viscosity at 500° F. of less than about 50,000 poises, said blending being conducted below the respective melting points of both the polyethylene terephthalate and polycarbonate materials;

b. extruding said composition at a temperature between about 490° to 530° F. whereby a sheet is obtained; and

c. rapidly cooling the resultant sheet by contact with at least one cooling surface maintained at a surface temperature in the range of about 50° to 160° F. for a period of time not exceeding 15 seconds, whereby a sheet is obtained, being non-oriented having a haze value as determined by ASTM D-1003 of less than about 2% wherein the polyethylene terephthalate portion of the sheet has a degree of crystallinity of less than 5%.

4,230,657

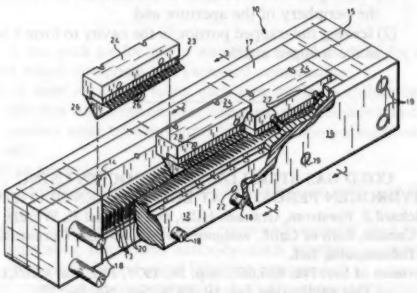
METHOD AND APPARATUS FOR PRODUCING ARTIFICIAL GREENERY

William M. Haack, St. Louis, and Dennis K. Peth, Florissaint, both of Mo., assignors to Keene Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,602

Int. Cl.² B29C *25/00, 17/00*; B29F *1/00*

U.S. Cl. 264—234 **5 Claims**



1. The method of producing plastic greenery for decorative purposes, such as artificial parsley, comprising

molding in plastic an elongated member from which project a plurality of sprigs of stems and buds spaced along the member with the stems and buds generally parallel to each other;

passing the elongated member and interconnected stems and buds through a hot water spray to soften and reorient the stems and buds; and

comprising the said stems and buds between two moving platens until the plastic cools to allow the stems and buds to be repositioned into conically-shaped interfering shapes;

whereby the plastic greenery resembles real greenery.

4,230,658

PROCESS FOR PREPARING BIAXIALLY DRAWN THERMOPLASTIC POLYESTER FILM

Kazuo Matsukura, Nara; Kunio Murakami, Jyoyo; Tsugio Nagasawa, Uji; Tadashi Hayashi, Uji, and Akiyoshi Kozuma, Uji, all of Japan, assignors to Unitika Limited, Hyogo, Japan

Filed Mar. 26, 1979, Ser. No. 24,053

Claims priority, application Japan, Apr. 17, 1978, 53/45763

Int. Cl.² B29C *17/02*

U.S. Cl. 264—235.8 **10 Claims**

1. In a process for preparing a biaxially drawn thermoplastic polyester film by concurrently-biaxially drawing a thermoplastic polyester film by a tenter technique, the improvement comprising the sequential steps of:

(a) preheating a thermoplastic polyester film in a preheating zone to a temperature higher than the temperature at which the film is to be drawn;

(b) concurrently biaxially drawing said preheated film at a temperature greater than the glass transition temperature of the polyester;

(c) heat treating said drawn polyester film in a heat treating zone at a temperature less than the preheating temperature; and

(d) progressively heating said heat treated film at increasingly higher temperature levels in a plurality of steps in a reheating zone, wherein the increments of temperature increase between progressively higher temperature levels are about the same.

4,230,659

METHOD FOR FORMING A RUPTURABLE AREA IN A CONTAINER

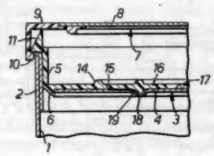
Brian L. C. Sutch, Thames Ditton, England, assignor to Airfix Industries Limited, London, England

Filed May 30, 1979, Ser. No. 43,903

Claims priority, application United Kingdom, May 31, 1978, 24748/78

Int. Cl.³ B29C *5/00*; B29F *1/00*

U.S. Cl. 264—266 **9 Claims**



1. A method of making a container wall a part of which is to be openable, the method comprising forming in the wall a path where the wall is to be ruptured, the path being a weakening in the material of the wall connecting the openable and an anchored part which is to remain in place after opening, locating the wall between mould tools, the tool on a first face of the wall including a rupture recess with which the path of weakening registers, and the tool on the other face of the wall defining a bead channel which extends along the length of the path and spans the path and a region of the wall on each side of the path

and injecting mouldable material into said bead channel to form a bead adherent to said other face of the wall, to displace those wall regions of the openable and anchored wall parts immediately adjacent the path into the rupture recess in the mould tool to further reduce the strength of the connection between openable and anchored wall parts and to form a seal at the displaced wall regions by adhering to the wall adjacent each displaced region and removing the wall from the mould, the resultant wall being openable by pull on the bead to disconnect the openable and anchored parts of the wall.

4,230,660

EPOXY-BORAX-COAL TAR COMPOSITION FOR A RADIATION PROTECTIVE, BURN RESISTANT DRUM LINER AND CENTRIFUGAL CASTING METHOD

Robert S. Taylor, and Norman W. Boyer, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1979, Ser. No. 3,840
Int. Cl.[2] A62D *5/00*; G21F *1/10*
U.S. Cl. 264—311 **8 Claims**

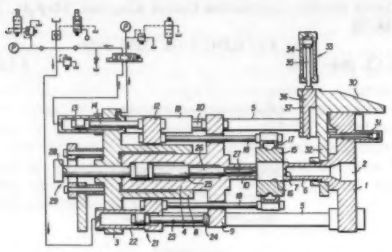
1. A method for producing a radiation protective, burn resistant material for drum liners used in radioactive waste storage, comprising the steps of: forming a mixture by mixing together substantially 10.8–16.2 weight percent of a first material consisting essentially of digycidyl ether of Bisphenol-A, substantially 4.6–6.9 weight percent of a second material consisting essentially of an aliphatic diepoxide, substantially 4.6–6.9weight percent of a third material consisting essentially of an aromatic amine, substantially 4.8–7.2 weight percent of a fourth material consisting essentially of an aliphatic amine, substantially 25–37.5 weight percent coal tar, and substantially 25–50 weight percent borax; and spinning the the mixture in a centrifugator for a time period of about 8–16 hours for forming the mixture into a liner and for curing of the thus formed liner.

4,230,661

INDIRECT EXTRUSION PROCESS

Akira Asari, Osaka; Masakazu Ueda, and Takeo Nishimoto, both of Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Sep. 27, 1978, Ser. No. 946,331
Claims priority, application Japan, Oct. 15, 1977, 52-123908
Int. Cl.[3] B29D *23/00*
U.S. Cl. 264—323 **4 Claims**



1. An indirect hot extrusion process with an extrusion apparatus having a die member operatively associated with a main ram and a container which are adapted to be driven independently of each other, said container being moved during extrusion at a speed equal to or greater than that of said main ram, so as to produce an extrusion force on a billet mounted in said container for cooperation with said die member comprising:

loading said billet in said container;

extruding said billet at least partially through said die member; and

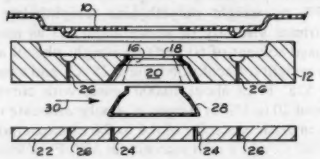
preventing movement of said container relative to said main ram and adding power for moving the container to the extrusion force so as to effect the extrusion without causing change in the relative position in accordance with the length of said billet by use of frictional force exerted between said container and said billet, so that the extrusion may be effected with respect to said container and said billet in a connected state of operation.

4,230,662

METHOD FOR FORMING HOLES IN THERMOFORMED ARTICLES

Clive D. Barnsbee, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1979, Ser. No. 6,052
Int. Cl.[3] B29C *17/04, 17/08*
U.S. Cl. 264—553 **5 Claims**



1. A method of forming holes in articles during thermoforming of such articles from sheet material, said method comprising the steps of:

A. heating sheet material to an article forming temperature;

B. placing the heated sheet material adjacent to a mold having

(1) a configuration corresponding to the article to be formed and

(2) an aperture which

(a) corresponds in area to the hole to be formed in the article and

(b) opens into a cavity having a cross-sectional area in a plane generally parallel to the aperture larger than the area of the aperture;

C. establishing a pressure differential across the sheet to

(1) form the sheet against the mold configuration, and

(2) expand the sheet into the cavity, thereby thinning the sheet in the region of the aperture and trapping a portion of the sheet in the cavity; and

D. stripping the article from the mold thereby

(1) causing the thinned region of the material to fracture at the periphery of the aperture and

(2) leaving the trapped portion in the cavity to form a hole in the stripped article.

4,230,663

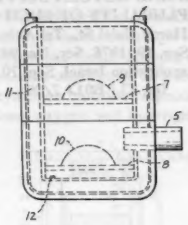
COLD GAS STERILIZATION PROCESS USING HYDROGEN PEROXIDE AT LOW CONCENTRATIONS

Richard J. Forstrom, Granada Hills, and Michael D. Wardle, La Canada, both of Calif., assignors to Moore-Perk Corporation, Indianapolis, Ind.

Division of Ser. No. 836,665, Sep. 26, 1977, Pat. No. 4,169,124.
This application Jul. 10, 1979, Ser. No. 56,177
Int. Cl.[3] A61L *2/20*; A01N *59/00*
U.S. Cl. 422—33 **4 Claims**

1. A method of disinfecting a contact lens without substantial liquid contact which comprises: placing said lens in a sealed container; contacting the lens with hydrogen peroxide gas

having a concentration of less than 75 mg/L; maintaining said gas in contact with such lens at temperatures below 80° C. until



such lens has been disinfected; venting the gas from the container; and removing the lens from the container.

4,230,664

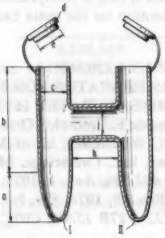
TEST PACK KIT FOR IMMUNOASSAY

Michael Cais, Haifa, Israel, assignor to Technion Research & Development Foundation Ltd., Technion City, Israel

Continuation-in-part of Ser. No. 795,457, May 10, 1977. This application Jan. 23, 1979, Ser. No. 5,754

Int. Cl.[2] G01N *33/16*

U.S. Cl. 422—61 **14 Claims**



1. A test pack kit for use in assaying a liquid medium for a ligand which comprises in a packaged combination:

(a) at least two assay tubes, each tube having a cylindrical side arm which can be interconnected with the side arm of another assay tube to form a leak-proof connecting channel;

(b) an antiserum;

(c) a conjugate of a metal-labelling substance with said ligand;

(d) a separation agent in vials containing material used for separating the bound antibody-metal labelling complex from the unbound metal labelling substance;

(e) assay calibration standards-in vials containing known concentrations of unlabelled ligand, and

(f) instrument calibration standards-in vials containing several containing several known concentrations of the metal-labelling substance.

4,230,665

APPARATUS FOR AUTOMATICALLY GENERATING AND MEASURING GASEOUS MEASURING SAMPLES FROM A SERIES OF LIQUID SAMPLES

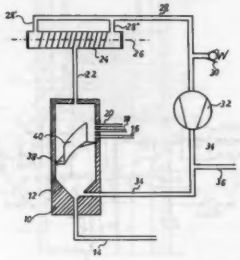
Bernhard W. Huber, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 917,829

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729744

Int. Cl.[3] G01N *27/66, 21/13, 33/20*

U.S. Cl. 422—64 **16 Claims**



1. An automatic system for generating gaseous samples from liquid samples and reagents and for transferring gaseous samples for measurements in an atomic absorption spectrometer, said system comprising:

means defining a reaction chamber having a first outlet in communication with an absorption spectrometer measuring cuvette and first, second, and third inlets for injecting liquid samples and first and second liquid reagents respectively into said chamber;

said reactor including a helical spillway adjacent its inner surface, said spillway having a vertical side wall for receiving injected fluids and directing said fluids downwardly along said spillway;

pumping means for withdrawing the liquid sample and the liquid reagents from respective supply vessels and injecting the sample and reagents through their respective inlets;

pump timing means for controlling the withdrawal and injection of sample and liquid reagents by said pumping means and operable in a plurality of discrete time periods within a test cycle including a first time period and a second time period subsequent to said first time period;

said pump timing means being operable during said first and second time periods to control said pumping means to substantially continuously inject liquid reagents at a substantially uniform rate into said reactor chamber;

said pump timing means being operable during said second time period to control said pumping means to substantially continuously inject liquid sample into said reactor at a substantially uniform rate, thereby enabling spectrometer analyses during said first and second time periods to provide indications of the amount of the element of interest contained in the liquid reagents and the amount of the element of interest contained in both the reagents and the liquid sample, respectively;

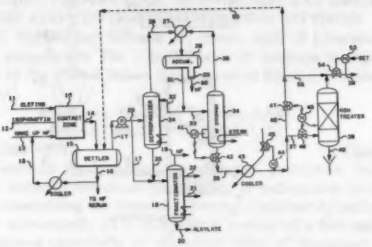
said reactor chamber being tubular and having a funnel shaped lower section, said first outlet being located adjacent the top of said tubular chamber, the apex of said funnel section terminating in a second outlet for draining liquid waste from said reactor chamber, means coupled and responsive to said pump timing means for draining liquid waste from said reactor chamber between the completion of said second time period and the beginning of the first time period of the next following test cycle.

4,230,666

HYDROCARBON PURIFICATION APPARATUS

Charles C. Chapman, and Joe Van Pool, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 824,583, Aug. 15, 1977, Pat. No. 4,123,351.
This application Jul. 11, 1978, Ser. No. 923,607
Int. Cl.[2] G05D *9/00, 16/00, 23/00*
U.S. Cl. 422—106 5 Claims



1. An apparatus for controlling the separation of HF from hydrocarbons in a manner such that excessive temperature increases above a preselected maximum allowable temperature due to unexpected excess HF is avoided, which apparatus comprises, in combination:

a stripping column having an inlet means for introducing feed into an intermediate portion of the column, an overhead outlet for removing materials stripped from the feed, and a bottom outlet for removing stripped feed containing residual HF and organic fluoride;

a vessel means containing solid KOH and having an inlet for introduction of stripped feed removed from said bottom outlet of said stripping column, an overhead outlet and conduit for removing KOH-treated feed, and a bottom outlet for removing sludge;

first conduit means connected to said bottom outlet of said stripping column and said feed inlet of said vessel means;

heat exchange means in said first conduit means for cooling said stripped feed removed from said stripping column;

by-pass conduit means connected to said first conduit means downstream of said heat exchange means for diverting flow of said stripped feed around said vessel means;

a first flow control valve which is normally open in said first conduit means positioned downstream of said heat exchange means and downstream of the junction point of said by-pass conduit means and said first conduit means and a second flow control valve which is normally closed positioned in said by-pass conduit means downstream of the junction point of said by-pass conduit means and said first conduit means; and

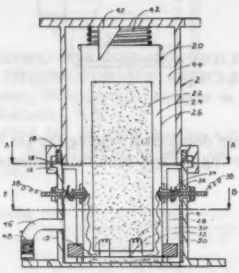
a temperature-sensing means in said vessel means connected to said first and said second control valves which are manipulated in response to a preselected maximum allowable temperature within said vessel means and when the measured temperature in said vessel means reaches a preselected maximum value said flow control valve is opened and said first flow control valve is closed so that flow of said stripped feed is diverted to said by-pass conduit means and around said vessel means.

4,230,667

REPLACEABLE CARTRIDGE TYPE OXYGEN GENERATOR AND OXYGEN SUPPLY SYSTEM INCLUDING A PLURALITY OF SUCH GENERATORS

Irving Williams, 4 Harav Uziel St., Tel Aviv, Israel

Filed Sep. 19, 1978, Ser. No. 943,745
Claims priority, application Israel, Sep. 20, 1977, 52970
Int. Cl.[2] B01J *7/00*
U.S. Cl. 422—113 25 Claims



1. A replaceable cartridge type oxygen generator, comprising: a quick-opening pressure casing including a main casing section, an openable casing section quickly openable and closable with respect to the main casing section, and sealing means sealing the two sections when closed together; a chemical oxygen-generating cartridge disposed within the casing, said chemical oxygen-generating cartridge having a severable hermetically sealed container and an ignition device for igniting the cartridge; an actuating device at least a portion of which is fixed to the casing so as to be cooperable with said ignition device to ignite the cartridge when the cartridge is in effective position within the casing, and a spring engageable by the cartridge and spacing same from said effective position to render the actuating device ineffective to actuate the ignition device except when the spring is compressed by the closing of the openable casing section on the main casing section.

4,230,668

PROCESS AND APPARATUS FOR PRODUCING HALOGENATED UNSATURATED HYDROCARBONS

Harold R. Sheely, Orleans; F. Frederick Oricchio, Duxbury, and Domenic C. Ferrari, Winchester, all of Mass., assignors to The Badger Company, Inc., Cambridge, Mass.

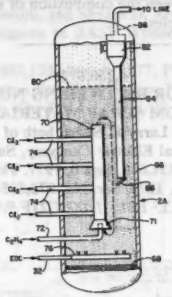
Division of Ser. No. 493,536, Aug. 1, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,508
Int. Cl.[3] B01J *8/22;* F27B *15/00;* C07C *21/06, 17/04*
U.S. Cl. 422—140 9 Claims

1. Apparatus for producing vinyl chloride monomer, said apparatus comprising in combination:

a reaction vessel, a bed of non-catalytic solids in said reaction vessel, means for feeding ethylene dichloride into said reaction vessel so as to fluidize said bed of solids, at least one solid transfer line connected at one end to a solids exit port in the bottom of said reaction vessel and at the opposite end to a solids reentry port in the side of said reaction vessel, a plurality of chlorine injection ports spaced along said solids transfer line between its ends, and means for feeding ethylene into said line adjacent the end connected to said solids exit port so as to cause solids to circulate from the bottom of said bed into and through said line and into the side of said reaction vessel, so that heat produced by the reaction of ethylene and chlorine in said solids transfer line can be absorbed by said circulating solids and carried into said reaction vessel, means for removing a reaction products effluent from said reaction vessel, means for separately recovering hydrogen chloride and vinyl

chloride from the effluent withdrawn from said reaction vessel,

an oxyhydrochlorination reactor containing an oxyhydrochlorination catalyst, means defining a source of ethylene, a source of oxygen and means defining a source of hydrogen chloride, means connecting said sources of ethylene, oxygen and hydrogen chloride respectively to means for feeding ethylene, oxygen and hydrogen chloride to said



oxyhydrochlorination reactor for contact with said oxyhydrochlorination catalyst whereby to form ethylene dichloride, means for removing the oxyhydrochlorination reaction effluent from said oxyhydrochlorination reactor, and means for recovering ethylene dichloride from the effluent removed from said oxyhydrochlorination reaction effluent and delivering said recovered ethylene dichloride to said means for feeding ethylene dichloride to said reaction vessel.

4,230,669

RADIAL AMMONIA CONVERTER

Raymond S. Eagle, and Vishnu A. Patel, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jul. 17, 1978, Ser. No. 925,137
Int. Cl.[2] B01J *8/00, 3/04*
U.S. Cl. 422—148 **9 Claims**

1. An ammonia converter system comprising:

a first, a second and a third annular-shaped, ammonia synthesis catalyst bed;

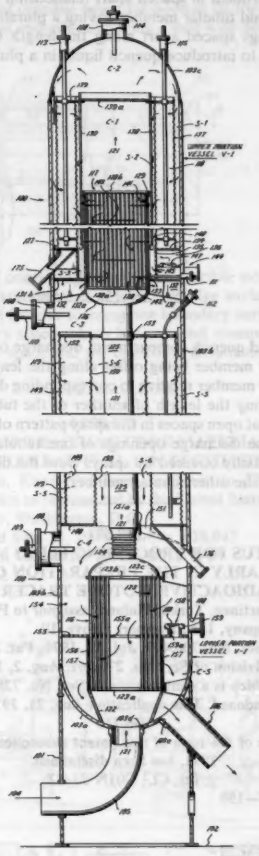
synthesis gas transfer means for directing essentially all ammonia synthesis gas to and for radially inward flow through said first catalyst bed to produce a first catalyst bed effluent containing ammonia;

first effluent transfer means for directing said first catalyst bed effluent as all the gas for radial flow through said second catalyst bed to produce a second catalyst bed effluent containing ammonia;

said first effluent transfer means including a tube bundle positioned inside of said first catalyst bed and in fluid communication therewith for cooling by indirect heat exchange the substantial portion of said effluent from said first catalyst bed prior to introduction of said first catalyst bed effluent into said second catalyst bed; and

second effluent transfer means for directing said second catalyst bed effluent as all the gas for radial flow through said third catalyst bed to produce a third catalyst bed effluent containing additional ammonia;

said second effluent transfer means including a tube bundle positioned below said second catalyst bed for cooling by indirect heat exchange the substantial portion of said effluent from said second catalyst bed prior to introduction of said second catalyst bed effluent into said third catalyst bed.



4,230,670

CARBON BLACK PRODUCING APPARATUS AND METHOD

Glenn J. Forseth, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1978, Ser. No. 871,676
Int. Cl.[2] C01B *49/00, 31/02*
U.S. Cl. 422—151 **18 Claims**

1. An apparatus for producing carbon black, said apparatus including:

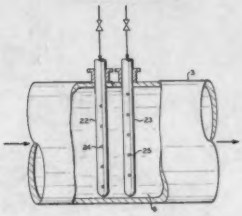
a housing defining a chamber which includes a combustion compartment, a reaction compartment downstream of the combustion compartment, and a quench compartment downstream of the reaction compartment;

first inlet means communicating with said combustion compartment and being operable for introducing combustion gases into said combustion compartment;

second inlet means communicating with said combustion compartment and being operable for introducing a make hydrocarbon into said combustion compartment for py-

rolysis by contact with hot combustion gases to produce combustion products containing carbon black;

a plurality of tubular members extending into said quench compartment in spaced apart relationship to one another, each said tubular member having a plurality of discharge openings spaced apart along the length thereof and directed to introduce quench liquid in a plurality of sprays



into said quench compartment, discharge openings of one tubular member being offset along the length of the one tubular member relative to corresponding discharge openings along the length of another of the tubular members such that open spaces in the spray pattern of quench liquid from the discharge openings of one tubular member are substantially covered by sprays from the discharge openings of the other tubular member.

4,230,671

APPARATUS FOR PROCESSING FLUID MATERIALS PARTICULARLY IN THE PREPARATION OF SAMPLES FOR RADIOACTIVE ISOTOPE TRACER STUDIES

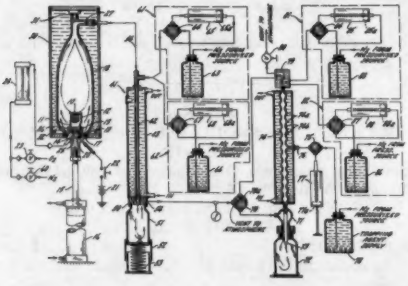
Niilo H. Kaartinen, Turku, Finland, assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Division of Ser. No. 706,499, Jul. 19, 1976, Pat. No. 4,148,608, which is a division of Ser. No. 277,261, Aug. 2, 1972, Pat. No. 3,979,503, which is a continuation of Ser. No. 728,939, May 14, 1968, abandoned. This application Aug. 21, 1978, Ser. No. 935,715

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] G01N *31/12*

U.S. Cl. 422—159 **22 Claims**



1. Apparatus for preparing isotope-containing samples for use in studies utilizing radioactive isotopes, said apparatus comprising the combination of

(a) a combustion chamber for combusting a sample material containing the isotope tritium to produce combustion products containing tritiated water vapor,

(b) means for continuously exhausting the tritiated water vapor from said combustion chamber during the combustion of said material,

(c) a heat exchanger for continuously cooling the exhausted combustion products to convert the tritiated water vapor to a liquid during the combustion of said material,

(d) a sample collection vessel and means for continuously removing said isotope-containing liquid from said heat exchanger during the combustion of said material and transferring said liquid to said collection vessel to provide a liquid sample containing the recovered isotopes for use in studies utilizing radioactive isotopes,

(e) and means for purging said combustion chamber and heat exchanger between the combustion of successive isotope-containing samples.

4,230,672

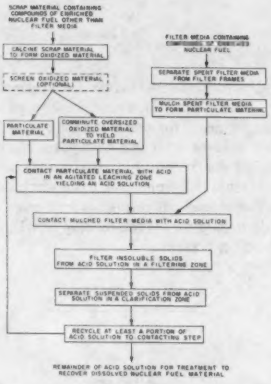
APPARATUS FOR RECOVERING NUCLEAR FUEL FROM SCRAP MATERIAL

Larry A. Divins, and Larry E. Short, both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 831,689, Sep. 8, 1977. This application Dec. 24, 1978, Ser. No. 972,525

Int. Cl.[2] B01J *1/00*; G21F *9/30*

U.S. Cl. 422—159 **3 Claims**


SCRAP MATERIAL CONTAINING COMPOUNDS OF ENRICHED NUCLEAR FUEL OTHER THAN FILTER MEDIA
FILTER MEDIA CONTAINING COMPOUNDS OF ENRICHED NUCLEAR FUEL
CALCINE SCRAP MATERIAL TO FORM OXIDIZED MATERIAL
SCREEN OXIDIZED MATERIAL (OPTIONAL)
SEPARATE SPENT FILTER MEDIA FROM FILTER FRAMES
MULCH SPENT FILTER MEDIA TO FORM PARTICULATE MATERIAL
PARTICULATE MATERIAL
COMMINUTE OVERSIZED OXIDIZED MATERIAL TO YIELD PARTICULATE MATERIAL
CONTACT PARTICULATE MATERIAL WITH ACID IN AN AGITATED LEACHING ZONE YIELDING AN ACID SOLUTION
CONTACT MULCHED FILTER MEDIA WITH ACID SOLUTION
FILTER INSOLUBLE SOLIDS FROM ACID SOLUTION IN A FILTERING ZONE
SEPARATE SUSPENDED SOLIDS FROM ACID SOLUTION IN A CLARIFICATION ZONE
RECYCLE AT LEAST A PORTION OF ACID SOLUTION TO CONTACTING STEP
REMAINDER OF ACID SOLUTION FOR TREATMENT TO RECOVER DISSOLVED NUCLEAR FUEL MATERIAL

1. An apparatus for recovering nuclear fuel in solution form from scrap materials, including spent filter media, comprising in combination:

(a) calcining means for calcining the scrap materials other than the spent filter media to form an oxidized material that is fed to

(b) comminuting means for crushing the oxidized material into a particulate material of desired particle size for feeding to

(c) a slab-shaped leaching means for contacting the particulate material with an acid solution at a rate enabling substantially complete dissolution of the nuclear fuel portion of the particulate material with the aid of mechanical agitation means to yield an acid solution,

(d) mulching means for mulching the spent filter media to yield a mulched filter media in particulate form,

(e) filter leach and repulping means for receiving the mulched filter media containing nuclear fuel material and for receiving the acid solution from the leaching means in a manner that the mulched filter media is contacted with the acid solution and the nuclear fuel material held by the mulched filter media is substantially dissolved in the acid solution,

(f) separator means for receiving the acid solution with undissolved solids from means (e) and removing the non-suspended undissolved solids from the acid solution, said separator means feeding the acid solution to

(g) leachate surge and reagent heat tank means for providing a constant output of the acid solution to

(h) clarification means that removes suspended solids from the acid solution,

(i) a recycle line for receiving at least a portion of the acid solution from the clarification means and recycling said portion to the leaching means, and

(j) means for receiving the remainder of the acid solution.

4,230,673

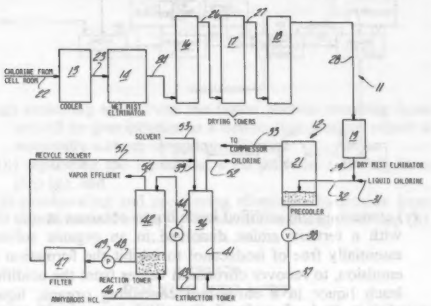
APPARATUS FOR REMOVING NITROGEN TRICHLORIDE FROM CHLORINE GAS

Edward N. Balko, Trenton, and Shyam D. Argade, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 803,133, Jun. 3, 1977, Pat. No. 4,138,296. This application Feb. 5, 1979, Ser. No. 9,635

Int. Cl.[2] B01J *1/00, 7/02*

U.S. Cl. 422—225 **9 Claims**



1. An apparatus for removing and destroying nitrogen trichloride contaminant present in chlorine produced electrolytically from brine comprising

an extraction device for receiving chlorine containing accumulations of nitrogen trichloride,

means for moving said contaminated chlorine and nitrogen trichloride to said extraction device,

means for adding an inert organic solvent to said extraction device in an amount sufficient to provide a safely diluted solution of nitrogen trichloride therein,

means for heating the extraction device to remove substantially all of the chlorine therefrom,

reactor means,

means for discharging chlorine from said extraction device,

means for moving the diluted solution of nitrogen trichloride from the extraction device to the reactor means,

means for adding a reaction component said reactor to react with nitrogen trichloride and to convert it to ammonium chloride,

means for discharging chlorine formed in said reactor,

means for removing the reaction mixture from said reactor, means for separating the solvent from the reaction mixture, removed from the reactor, after the conversion of the nitrogen trichloride, and

means for recycling the separated solvent from said reactor to the extraction device.

4,230,674

CRUCIBLE-DIE ASSEMBLIES FOR GROWING CRYSTALLINE BODIES OF SELECTED SHAPES

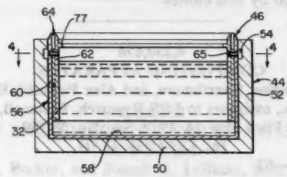
Aaron S. Taylor, Acton, Mass., and Richard W. Stormont, Warwick, R.I., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Dec. 27, 1976, Ser. No. 754,422

Int. Cl.[2] C30B *15/34*

U.S. Cl. 422—246 **11 Claims**

1. Apparatus for use in a system for growing crystalline bodies of selected shape from a melt which is delivered from a crucible to a liquid/solid growth interface by a capillary die, said apparatus comprising a crucible and capillary die combination in which (1) at least a part of the die is an integral portion of the crucible and (2) the crucible is an essential portion of the die, said crucible being (a) open at its top end, (b) closed at its bottom end and (c) having a side wall defining an



interior space for containing a melt, said crucible side wall (i) having an upper end defining at least one edge surface of the die, said side wall (ii) also forming one boundary surface of at least one capillary space which has one end communicating with said interior space and the other end terminating at said upper end.

4,230,675

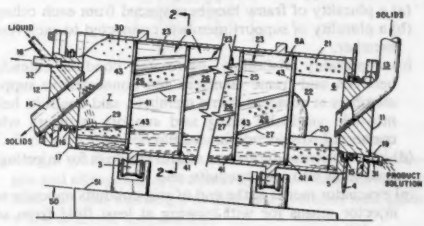
APPARATUS FOR LEACHING CORE MATERIAL FROM CLAD NUCLEAR FUEL PIN SEGMENTS

Orlan O. Yarbro, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 15, 1978, Ser. No. 878,047

Int. Cl.[3] B01D *11/02;* **B01F** *1/00*

U.S. Cl. 422—272 **8 Claims**



1. In rotary apparatus for countercurrently contacting liquids and solids, said apparatus including an elongated and generally cylindrical drum assembly which is rotatable in either direction about its longitudinal axis and which is divided by circumferentially sealed, transversely extending partitions into a solids-inlet/liquid-outlet compartment at one end of said assembly, a solids-outlet/liquid-inlet compartment at the other end thereof, and a plurality of leaching compartment therebetween, said partitions being provided with perforations for conveying liquid flow between adjacent compartments; each of said leaching compartments containing a solids-transfer chute assembly for advancing solids into the next compartment in the direction of solids flow when said drum assembly is rotated in a selected direction, each chute assembly including a solids-transfer chute and a perforated baffle for directing solids into said chute when said drum assembly is rotated in said selected direction; the improvement comprising:

said partitions being formed with corresponding outer annular imperforate regions, each region extending inwardly from the rim of its respective partition to an annular array of perforations concentric with said rim, each region having a width which prevents intercompartmental backflow of relatively dense liquid along the bottom portion of said assembly and which corresponds to the desired maximum depth of liquid in said leaching compartments, and

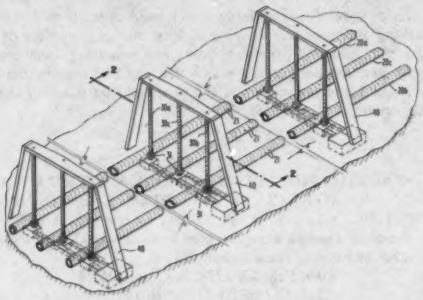
said drum assembly being disposed with its solids-outlet/liquid-inlet end at a higher elevation than its other end, the longitudinal axis of said drum assembly forming an angle in the range of from about 3° to 14° with the horizontal, said angle establishing in said assembly liquid levels for effecting forward flow through the annular arrays while substantially preventing backflow therethrough of waves produced by said chutes.

4,230,676

COMPOSTING APPARATUS

Lauren P. Taylor, Swarthmore, and Alex Petroski, Springfield, both of Pa., assignors to LRS Research, Broomall, Pa.

Filed May 14, 1979, Ser. No. 38,700
Int. Cl.[2] C05F *11/08*
U.S. Cl. 422—62 **24 Claims**



1. A composting apparatus for use in composting organic material, said apparatus comprising:
(a) a plurality of frame members spaced from each other;
(b) a plurality of support members connected to each frame member;
(c) a plurality of hollow, perforated conduits extending between said frame members and connected to support members at adjacent frame members, said conduits being movable vertically along said support members while connected to said support members;
(d) injector means at one end of said conduits for injecting at least fluid into said conduits; and
(e) evacuator means at the end of said conduits opposite said injector means for withdrawing at least fluid from said conduits.

7. A composting apparatus as claimed in claim 1, said apparatus further comprising:
analysis means associated with said evacuator means for analyzing at least a portion of at least said fluid withdrawn from said material, whereby said analysis means indicates the compost state of said material.

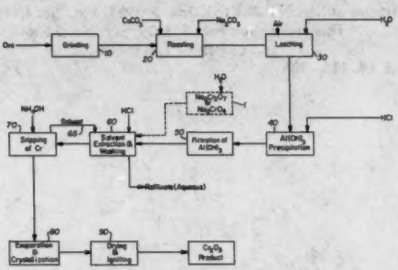
4,230,677

RECOVERY OF Cr_2O_3 FROM A CHROMIUM BEARING SOLUTION

Tadashi J. Kagetsu, Lewiston; William B. De Atley, Grand Island, both of N.Y.; Joseph S. Fox, Altamonte Springs, Fla., and Oreste J. Malacarne, Grand Junction, Colo., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 857,511, Dec. 5, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 963,805
Int. Cl.[3] C01G *37/033*
U.S. Cl. 423—54 **8 Claims**

1. A method for recovering high purity Cr_2O_3 from chromium ore which comprises:
(i) roasting in a gaseous oxidizing environment a mixture of chromium ore with Na_2CO_3 and CaO at a temperature in the range of about 600° C. to 1100° C. for from about 0.5 to 6 hours, the amount of Na_2CO_3 being that which provides from about 1.4 to 4.2 pounds of Na_2CO_3 per pound of Cr_2O_3 in the ore and the amount of CaO being that which provides from about 0.6 to 1 pound of CaO per pound of Cr_2O_3 in the ore;
(ii) water leaching roasted material obtained in step (i) at a temperature of from about 5° C. to the boiling point of water for from about 5 minutes to 5 hours;
(iii) adding acid to the leach liquor obtained in step (ii) to provide a pH of from about 3 to 9.5 to cause precipitation of aluminum impurities and separating said impurities from the leach liquor;
(iv) adding acid to the leach liquor to provide a pH of about 1 to 2;



(v) contacting the acidified leach liquor obtained in step (iv) with a tertiary amine dissolved in an organic solvent essentially free of isodecanol to inhibit the formation of emulsion, to recover chromium values from the acidified leach liquor in a chromium containing organic liquid phase;
(vi) treating the chromium containing organic phase with a water solution of NH_4OH to obtain a solution of $(NH_4)_2CrO_4$;
(vii) subjecting the solution of $(NH_4)_2CrO_4$ to evaporation to provide a solid chromium-bearing material; and
(viii) igniting the solid chromium-bearing material to obtain Cr_2O_3.

4,230,678

PROCESS FOR RECOVERING ALUMINUM FROM ALUNITE

George J. Hartman, Arvada, and Vernon R. Ewing, Denver, both of Colo., assignors to Earth Sciences, Inc., Golden, Colo.; National Steel Corporation, Pittsburgh, Pa. and Southwire Company, Carrollton, Ga.

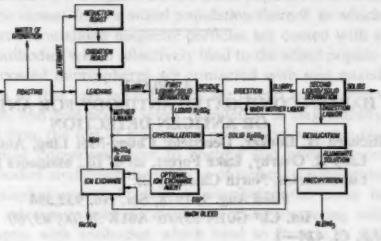
Continuation of Ser. No. 865,093, Dec. 27, 1977, abandoned, which is a continuation of Ser. No. 724,449, Sep. 20, 1976, abandoned, which is a division of Ser. No. 582,806, Jun. 2, 1975, Pat. No. 3,996,333. This application Feb. 14, 1979, Ser. No. 12,181
The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.
Int. Cl.[3] C01F *7/06, 7/14*
U.S. Cl. 423—112 **10 Claims**

1. A process for recovering aluminum hydroxide from aluminum-bearing ore containing substantial amounts of potassium and sulfate comprising the following steps:
(a) roasting the ore to remove water and leaching the roasted ore with an alkaline solvent or water to remove compounds of sulfur and alkali metals including potassium sulfate resulting in a residue containing aluminum values and a solution containing potassium sulfate;
(b) separating the residue and solution of step (a);
(c) recovering potassium sulfate from the solution of (b) by crystallization while bleeding off a portion of potassium sulfate from the mother liquor;
(d) contacting an anion exchange agent loaded with hydroxyl ions with the potassium sulfate bleed stream to

replace said hydroxyl ion with sulfate to form potassium hydroxide and cycling said potassium hydroxide to the leaching of step (a);

(e) digesting the residue from step (b) with at least one alkali metal hydroxide at a concentration and at a temperature sufficient to dissolve substantially all of the aluminum values from said solid portion as aluminates;

(f) separating the liquid and solid portions of the slurry resulting from step (e);



(g) removing silica from the liquid portion resulting from step (f) by precipitation as a desilication product which is essentially sodium aluminum silicate;

(h) separating the liquid and solid portions resulting from step (g); and

(i) precipitating and recovering aluminum hydroxide from the aluminates in the liquid portion resulting from step (h).

4,230,679

POLY(SILICIC ACID)

Walter Mahler, and William O. Forshey, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1978, Ser. No. 972,423

Int. Cl.[3] C01B *33/14*

U.S. Cl. 423—325 **17 Claims**

1. Particulate, porous, water-insoluble hydrophilic, thermally stable, amorphous poly(silicic acid) which is of the empirical formula $[Si_3O_5(OH)_2]\cdot(H_2O)_n$ wherein n is a fractional or whole number within the range about 0 to 6 and which is characterized by an average pore diameter of 60 A to about 300 A and a surface area of greater than 850 m^2/g.

5. Particulate, porous, water-insoluble, amorphous poly(silicic acid) which is of the empirical formula $[Si_3O_5(OH)_2]\cdot(H_2O)_n$ wherein n is a fractional or whole number within the range about 0 to 6 and which is characterized by a pore volume of 1.8 ml/g to about 8.5 ml/g and a surface area of greater than 850 m^2/g.

7. Process for preparing particulate, porous, water-insoluble, hydrophilic, thermally stable, amorphous poly(silicic acid) by acidifying an appropriate aqueous silicate solution, allowing the silicic acid thus formed to polymerize to poly(silicic acid), freezing the acidified solution, and thereafter thawing the acidified solution and isolating therefrom, washing, drying and recovering particulate poly(silicic acid), said process further characterized in that:

(a) the amount of silicate in the aqueous silicate solution is such that the SiO_2 content of the acidified solution is about 4 to 25 weight % and such that the acidified solution contains about 15 to 150 weight %, based on the weight of SiO_2, of at least one water-soluble compound which is precipitable from the acidified solution at $-10°$ to $-200°$ C. and which is inert to the silicate, silicic acid and poly(silicic acid);

(b) the aqueous silicate solution is acidified to a pH of about 3 to 9;

(c) the acidified solution is cooled to a temperature of about $-10°$ to $-200°$ C. until it is frozen to separate substantially all of the chemically unbound water as substantially pure ice and to precipitate water soluble compound within the pores of the poly(silicic acid) particles being formed; said acidified solution being in gelled form prior to cooling.

4,230,680

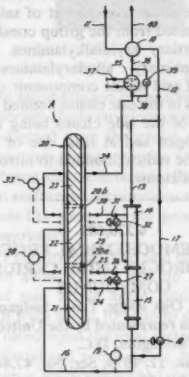
LOW ENERGY PROCESS FOR SYNTHESIS OF AMMONIA

Colman L. Becker, and Joseph R. LeBlanc, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jul. 17, 1978, Ser. No. 925,138

Int. Cl.[2] C01C *1/04*

U.S. Cl. 423—360 **11 Claims**



1. A process for the synthesis of ammonia, comprising:

passing a synthesis feed gas consisting essentially of hydrogen and nitrogen in approximately a 3 to 1 ratio through at least one heat exchanger to heat said synthesis feed gas to a first reaction temperature;

passing said heated synthesis gas at said first reaction temperature through a first ammonia synthesis catalyst bed wherein an exothermic reaction occurs to produce a first effluent containing ammonia;

passing a portion of said first catalyst bed effluent through a heat exchanger to cool said effluent portion and mixing said cooled first effluent portion with the remainder of said first catalyst bed effluent to adjust the temperature of said first catalyst bed effluent to a second reaction temperature;

passing said first catalyst bed effluent at said second reaction temperature through a second ammonia synthesis catalyst bed for exothermic reaction to produce a second catalyst bed effluent containing further ammonia;

passing a portion of said second catalyst bed effluent through another heat exchanger to cool said second effluent portion and mixing said cooled second effluent portion with the remainder of said second catalyst bed effluent to adjust the temperature of said second catalyst bed effluent to a third reaction temperature; and

passing said second catalyst bed effluent at said third reaction temperature through a third ammonia synthesis catalyst bed wherein an exothermic reaction occurs to produce a third effluent containing further ammonia.

4,230,681
METHOD OF MANUFACTURING HYDROGEN CHLORIDE FROM SOLUTIONS OF AMINE HYDROCHLORIDES

Alfred Coenen; Kurt Kosswig; Bernhard Hentschel, and Jürgen Ziebarth, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 10,048

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805933

Int. Cl.[2] C01B *7/08*

U.S. Cl. 423—481 **6 Claims**

1. A method of manufacturing hydrogen chloride from solutions of amine hydrochlorides comprising:

(a) heating said solutions in an inert, organic essentially non-polar solvent at temperatures of about 120°–230° C., said solvent having a boiling point at least 20° C. above said temperature of heating;

(b) simultaneously with said heating, passing an inert gas stream through the heated solutions of (a) to split off hydrogen chloride and produce a mixture of hydrogen chloride and said inert gas; and

(c) separating said hydrogen chloride from said mixture of (b) wherein the amine component of said amine hydrochlorides is selected from the group consisting of tertiary alkylamines, tertiary aryldialkylamines, secondary arylalkylamines, primary alkylarylamines or mixtures thereof, each of said amine components containing 14 to 36 carbon atoms in the side chains bonded to nitrogen, not more than one of the side chains being a methyl group bonded to nitrogen and at least one of the side chains being an aliphatic radical, bonded to nitrogen, containing at least 6 carbon atoms.

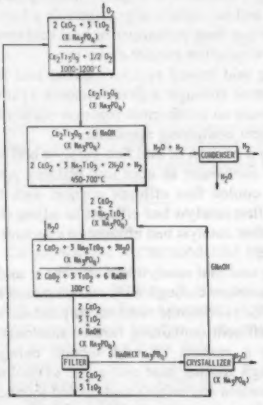
4,230,682
CYCLIC THERMOCHEMICAL PROCESS FOR PRODUCING HYDROGEN USING CERIUM-TITANIUM COMPOUNDS

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 11, 1979, Ser. No. 47,447

Int. Cl.[3] C01B *1/02*

U.S. Cl. 423—579 **8 Claims**



1. A cyclic process for splitting water into hydrogen and oxygen, comprising the steps of:

(1) reacting ceric oxide and titanium dioxide to form cerium titanate and oxygen, and separating thus-formed oxygen from the reaction environment;

(2) reacting cerium titanate formed in step (1) with an alkali metal hydroxide, to form ceric oxide, an alkali metal titanate, water and hydrogen, and recovering the thus-formed hydrogen;

(3) reacting ceric oxide and the alkali metal titanate formed in step (2) with water to yield ceric oxide, alkali metal hydroxide and titanium dioxide;

(4) recycling thus-produced ceric oxide and titanium dioxide to step (1); and

(5) recycling thus-produced alkali metal hydroxide to step (2).

4,230,683
HAPTEN CONJUGATED ANTIBODY FOR ANTIBODY OR ANTIGEN DETECTION

Richard H. Decker, Deerfield; Chung-Mei Ling, Antioch, and Lacy R. Overby, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 9, 1978, Ser. No. 932,394

Int. Cl.[2] G01N *33/16*; A61K *39/00, 43/00*

U.S. Cl. 424—1 **5 Claims**

1. In an immunoassay method for determining an antigen or an antibody from a test sample and bound to a solid support, the improvement comprising reacting the antigen or antibody bound to the solid support with an antibody having a hapten conjugated thereto and then reacting the hapten portion with labeled antihapten antibody, and measuring the labeled antihapten antibody bound to the solid support.

4,230,684
METHOD FOR DETERMINING STEROIDS IN HUMAN BODY LIQUIDS

Songja Pang, and Maria I. New, both of New York, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,326

Int. Cl.[2] A61K *43/00*; G01N *33/16*; B65D *81/32*

U.S. Cl. 424—1 **16 Claims**

1. A method for determination of a steroid contained in a sample of a human body liquid which comprises the steps of:

(a) transferring said liquid sample onto a sheet of material which is capable of uniformly absorbing said liquid sample;

(b) drying the sample-containing sheet;

(c) treating a portion of the dry sample-containing sheet, which is equivalent to a predetermined amount of the sample, with an aqueous solvent in order to obtain a mixture wherein the dried sample of human body liquid is substantially redissolved in the aqueous solvent;

(d) extracting said aqueous mixture with a volatile organic solvent capable of dissolving said steroid in order to obtain an organic extract containing said steroid dissolved therein;

(e) separating at least a portion of said organic extract from said aqueous mixture;

(f) recovering a residue containing the steroid from said organic extract;

(g) contacting said residue with an aqueous solution of an agent, said agent being capable of selectively binding said steroid, in the presence of a radioisotopically labeled form of the steroid, whereby part of said labeled steroid and part of said unlabeled steroid present in the sample, are bound by forming a complex with said binding agent, separating said bound steroids from unbound steroids in said aqueous solution and measuring the radioactivity of at least said separated binding agent-steroids-complex or said unbound steroids to determine the concentration of said hormone as a function of the measured radioactivity.

4,230,685

METHOD OF MAGNETIC SEPARATION OF CELLS AND THE LIKE, AND MICROSPHERES FOR USE THEREIN

Andrew E. Senyei, and Kenneth J. Widder, both of Chicago, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Feb. 28, 1979, Ser. No. 15,895
Int. Cl.[2] G01N *31/00, 21/46*
U.S. Cl. 424—12 10 Claims

1. A method for the separation of a select population of cells, bacteria, or viruses from a mixed population thereof, in which microspheres containing magnetic particles are coated with a layer of antibodies which selectively bind to the select population, the coated microspheres are contacted with said mixed population so that said microspheres are bound to the select population, and said bound select population is magentically separated from the rest of said mixed population, wherein the improvement comprises: prior to coating said microspheres with antibodies modifying the surfaces of said microspheres to provide staphylococcal Protein A distributed thereover in adherent relation to said microspheres, then contacting said microspheres with antibodies which bind to Protein A and which also bind selectively to said select population, whereby said antibodies are arranged in oriented attachment on the surfaces of said microspheres with their Fab arms extending outwardly, and thereafter carrying out the rest of the steps of said method.

4,230,686

DRUG EXCIPIENT OF SILICONE RUBBER

Gisela Schopflin; Peter Fuchs, both of Berlin, and Karl H. Kolb, Holzhausen, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 563,233, Mar. 28, 1975, abandoned, which is a division of Ser. No. 444,886, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 307,940, Nov. 20, 1972, abandoned. This application Dec. 23, 1976, Ser. No. 753,876
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1971, 2158226
Int. Cl.[2] A61K *9/22, 9/26*
U.S. Cl. 424—22 16 Claims

1. A nontoxic pharmaceutical composition adapted for implantation into a human or animal body to provide a constant, uniform drug release rate over a time interval of several months or years, said composition being substantially free of peroxide, acetic acid and metal salts of carboxylic acids and consisting essentially of a homogeneous mixture of:

(a) 85–95 parts by weight of a LTV linear dimethylpolysiloxane resin containing 0.05–0.5 molar percent of methylvinylsiloxane units, having a molecular weight of 20,000–50,000 and containing an average of 1.58–2.02 monovalent hydrocarbon residues per silicone atom;

(b) correspondingly 15–5 parts by weight of a crosslinking composition consisting essentially of a dimethylpolysiloxane crosslinking agent substantially free of methylvinylsiloxane units, having a molecular weight of 500–1000 and containing 1–3 Si—H bonds per molecule;

(c) a catalytic amount of a noble-metal based crosslinking catalyst; and

(d) a pharmaceutically active amount of a nonionic, lipophilic drug dissolved or uniformly suspended in said composition.

4,230,687

ENCAPSULATION OF ACTIVE AGENTS AS MICRODISPERSIONS IN HOMOGENEOUS NATURAL POLYMERIC MATRICES

Louis Sair, Evergreen Park, and Ralph A. Sair, Lincolnwood, both of Ill., assignors to Griffith Laboratories U.S.A., Inc., Alsip, Ill.

Continuation-in-part of Ser. No. 779,463, Mar. 21, 1977, abandoned, and Ser. No. 719,740, Sep. 2, 1976, abandoned. This application May 30, 1978, Ser. No. 910,101
Int. Cl.[3] A01N *25/28;* A61K *9/26, 31/07;* B01J *13/02*
U.S. Cl. 424—22 15 Claims

1. A method of encapsulation of an active agent as a microdispersion in a storage-stable enveloping matrix of an encapsulating material selected from the group consisting of chemically modified starches, gums, proteins and mixtures thereof,

said method being characterized in that the encapsulating material is transformed thereby into a homogeneous, continuous, paste-like phase during processing thereof, said method comprising:

combining 1 part by weight of said encapsulating material with from about 1/25th part up to about 5 parts by weight of said active agent, and water in a limited amount of from about 10% up to about 50% by weight of water based upon the total weight of water, encapsulating material and active agent, but in an amount limited to ensure development and maintenance of a homogeneous, high-viscosity paste system during processing thereof,

applying shearing stress and vigorous mechanical working and any necessary heat to said paste system to distribute said active agent throughout said encapsulating material as a microdispersion under processing conditions to avoid compaction and molding compression forces, thereby to prevent mechanical expulsion of said active agent from said encapsulating material,

mechanically working said paste system into a very viscous mobile and formable mass having a viscosity in excess of about 50,000 centipoises and in which said active agent is distributed as micro particles throughout said homogeneous encapsulating material,

mechanically shaping said mass without applying compression force effective to expel said active agent therefrom, thereby to provide a product of selectable physical configuration, and

drying said product by a process other than spray drying to provide a storage-stable homogeneous matrix of said encapsulating material having protectibly and releasably enveloped therewithin said active agent as a microdispersed phase distributed substantially uniformly therethrough.

9. A Vitamin A concentrate comprising Vitamin A distributed as a microdispersion throughout a homogeneous protective matrix consisting essentially of a natural polymeric encapsulating medium derived from a proteinaceous material,

said concentrate being characterized by high stability of said encapsulated Vitamin A upon storage,

and produced in accordance with the method of claim 1.

4,230,688
ACYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

David G. Rowsell, Staines; David J. Spring, Datchet, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, England

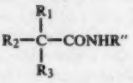
Continuation of Ser. No. 768,219, Feb. 14, 1977, Pat. No. 4,153,679, which is a division of Ser. No. 351,357, Apr. 16, 1973, abandoned. This application May 7, 1979, Ser. No. 36,662
Claims priority, application United Kingdom, Apr. 18, 1972, 17914/72
The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.
Int. Cl.[3] A61K *7/16*; A61L *9/04*
U.S. Cl. 424—45 15 Claims

1. In a manufactured consumer product for application to or consumption by the human body, said product comprising a vehicle topically administrable to or consumable by the human body and containing as an adjuvant in said vehicle, a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of the body when brought into contact therewith by topical application or consumption of the said vehicle, said product being:

(i) A toiletry comprising a topically administrable vehicle containing as adjuvants therein (a) said cold receptor stimulating compound and (b) at least one of the following: an odourant, antiseptic, colourant or surfactant;

(ii) a foodstuff or beverage comprising an orally ingestible vehicle containing as adjuvants therein (a) said cold receptor stimulating compound and (b) a flavourant; or

(iii) a tobacco or tobacco-containing manufacture containing said cold receptor stimulating compound; the improvement which comprises using as said cold receptor stimulating compound an effective amount of a cold receptor stimulating acyclic carboxamide of the formula:



wherein

R″ is C_1–C_5 alkyl, C_1–C_8hydroxyalkyl or alkylcarboxyalkyl of up to 6 carbon atoms;

R_1 is H or C_1–C_5 alkyl; and

R_2 and R_3 are each C_1–C_5 alkyl;

with the provisos that

(i) R_1, R_2 and R_3 together provide a total of at least 5 carbon atoms; and

(ii) when R_1 is hydrogen then R_2 is C_2–C_5 alkyl and R_3 is C_3–C_5 alkyl branched at the carbon atom in the alpha or beta position.

4,230,689
HAIR GROOMING COMPOSITION OF MATTER

Sue Choy, 4109 Whispering La., Annandale, Va. 22003

Filed May 1, 1979, Ser. No. 34,980
Int. Cl.[3] A61K *7/06*
U.S. Cl. 424—74 3 Claims

1. A composition of matter for use in the grooming of human hair, which composition is prepared by the process which comprises the steps of:

(a) hydrating with water to hydration an admixture of 1 part white rice with 0.1 to 2 parts mung bean;

(b) heating said admixture to a temperature of about 75° F. to about 212° F. in the presence of 1 cup of Ginseng tea;

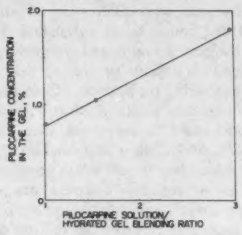
(c) enclosing said heated admixture in a closed environment to provide a means to acquire the condensate of the vapors of said heated and enclosed admixture; and

(d) recovering said condensate of said heated and enclosed admixture as said hair grooming composition of matter.

4,230,690
HIGH-VISCOSITY EYE LOTIONS

Aizo Yamauchi, Atsugi; Yasuo Matsuzawa, Machida; Sadayoshi Kamiya, Nagoya; Keisuke Nishioka, Yao; Yoshiaki Hara, Kashiwara, and Shogo Matsushima, Nara, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo and Nihon, Tenganyaku Kenkyusho K.K., Aichi, both of, Japan

Filed Apr. 26, 1979, Ser. No. 33,523
Claims priority, application Japan, Apr. 30, 1978, 53-51098
Int. Cl.[3] A61K *31/74*
U.S. Cl. 424—78 6 Claims



1. high-viscosity eye lotion comprising a flowable swollen hydrated gel of a cross-linked polyvinyl alcohol having an equilibrium swelling ratio in the range from 70 to 100 by weight at room temperature as a carrier medium and an ophthalmically active ingredient in a therapeutically effective concentration in said carrier medium.

4,230,691
NERVE GROWTH FACTOR ANTIBODY AND PROCESS

David M. Young, Sherborn, Mass., assignor to The Massachusetts General Hospital, Boston, Mass.

Filed May 23, 1978, Ser. No. 908,762
Int. Cl.[2] A61K *39/00*; C07G *7/00*; A61K *37/02*
U.S. Cl. 424—85 5 Claims

1. A composition having the property of inhibiting the plasminogen activator activity of nerve growth factor having a molecular weight of about 116,000 and being derived from a source selected from the group consisting of mouse submandibular gland, mouse saliva and mixtures thereof, said composition comprising the antibody of said nerve growth factor and being isolated from the blood serum of an animal to which said nerve growth factor has been previously added.

4,230,692
RAVIDOMYCIN AND PROCESS OF PREPARATION

Surendra N. Sehgal, Dollard des Ormeaux, and Claude Vezina, Oka, both of Canada, assignors to Ayerst McKenna & Harrison, Inc., Montreal, Canada

Filed Nov. 3, 1978, Ser. No. 957,509
Int. Cl.[3] A61K *35/00*
U.S. Cl. 424—122 6 Claims

1. Ravidomycin which:

(a) is bright yellow crystalline compound, m.p. 255° C. with decomposition, after recrystallization from diethyl ether;

(b) is soluble in acetone, methanol, ethanol, chloroform, and sparingly soluble in diethyl ether;

(c) shows a uniform spot on thin layer plates of silica gel;

(d) has a characteristic elemental analysis of about C, 65.73%, H, 6.34%, N, 2.73%;

(e) exhibits the following characteristic absorption maxima in its ultraviolet absorption spectrum (95% v/v ethanol) 286 nm ($E_{1\ cm}^{1\%}$ 696) and 246 nm ($E_{1\ cm}^{1\%}$ 672);

(f) has a characteristic infrared spectrum in chloroform as shown in accompanying FIG. 1; and

(g) has a characteristic nuclear magnetic resonance spectrum in deuterochloroform as shown in accompanying FIG. 2.

4,230,693

ANTACID TABLETS AND PROCESSES FOR THEIR PREPARATION

Henry J. Izzo, Naperville; Martin J. Moran, Oak Lawn, both of Ill., and Frederick G. Wheeler, Poplarville, Miss., assignors to Armour-Dial, Inc., Phoenix, Ariz.

Continuation of Ser. No. 569,947, Apr. 21, 1975, abandoned. This application Dec. 3, 1976, Ser. No. 747,172

Int. Cl.[3] A61K *33/10, 33/08*

U.S. Cl. 424—156 5 Claims

1. In a process for preparing an antacid tablet in which an antacid ingredient, sugar and fat are combined to provide a powdered mixture, the step of feeding said mixture into a tableting machine while maintaining the plungers and dies of said machine at a temperature of from 110° to 125° F.

4,230,694

PROCESS FOR PREVENTION OF PLANT INFECTIONS CAUSED BY SCATTERED SPORES AND COMPOSITION

Kiyoshi Saotome, 2-4-10, Setagaya, Setagaya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 798,033, May 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 630,889, Nov. 11, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 949,852

Int. Cl.[3] A01N *27/00, 61/02*

U.S. Cl. 424—172 13 Claims

1. A method for protecting plants from diseases caused by airborne carriers which comprises:

applying to a plant, an effective amount to protect said plants against such airborne diseases, of a W/O emulsion of a hard paraffin having substantially the same number of carbon atoms as that naturally present on the surface of the plant;

said emulsion being prepared by emulsifying said paraffin with a C_{12} to C_{18} fatty acid soap to produce an emulsion having colloidal particles consisting essentially of those within the range of from 1 to 5 microns;

said emulsion, after evaporation of water therefrom depositing a block-like film of paraffin on said plant.

4,230,695

ENHANCED PROTEIN ASSIMILATION WITH FRUCTOSE

Richard E. Ecker, Hinsdale, Ill., assignor to Vitose Corporation, Clarendon Hills, Ill.

Filed Aug. 2, 1976, Ser. No. 710,572

Int. Cl.[2] A61K *37/02, 31/70*

U.S. Cl. 424—177 8 Claims

1. A process for facilitating the assimilation of dietary protein into body tissue comprising:

orally administering to a subject a dietary supplement including substantially pure fructose and a protein having a protein efficiency ratio of about 2.5 or greater; and

eliminating the consumption by said subject of substantially all insulin-stimulating carbohydrates for a period prior to said oral administration of sufficient duration to reduce the insulin present in the bloodstream of said subject at the time of said administration to near basal levels and for a period subsequent to said oral administration of sufficient duration to allow substantially complete assimilation of said protein into body tissue.

4,230,696

POLYPEPTIDES USEFUL FOR THE PURPOSE OF TREATING MULTIPLE SCLEROSIS

George A. Hashim, Irvington, N.Y., assignor to St. Luke's Hospital, New York, N.Y.

Continuation-in-part of Ser. No. 648,379, Jan. 12, 1976, Pat. No. 4,113,858, which is a continuation-in-part of Ser. No. 542,175, Jan. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 315,140, Dec. 12, 1972, Pat. No. 3,864,481. This application Sep. 11, 1978, Ser. No. 941,001

Int. Cl.[3] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 28 Claims

1. A synthetic compound selected from those of formula:

$$R_1—Gln—R_4—R_5$$

and the acid addition salts thereof, wherein R_1 and R_5 are each independently selected from the group consisting of hydrogen, hydroxy, the residue of an amino acid and the residue of a polypeptide and R_4 is selected from the group consisting of lysine and arginine residues; provided that R_1 and R_5 are not both hydrogen or both hydroxyl at the same time.

4,230,697

VIRUS-INACTIVATED HGI-GLYCOPROTEIN CAPABLE OF STIMULATING PROLIFERATION AND DIFFERENTIATION OF HUMAN GRANULOCYTE, PROCESS FOR PREPARING SAME AND LEUKOPENIA CURATIVE CONTAINING SAME

Masayuki Nishida, Osaka; Satoshi Funakoshi, Katano; Katsuhiro Ogasa, Yokohama; Morio Kuboyama; Nobuya Yanai, both of Tokyo, and Muneo Yamada, Kodaira, all of Japan, assignors to Morinaga Milk Industry Co. Ltd., Tokyo and The Green Cross Corporation, Osaka, both of, Japan

Filed May 9, 1979, Ser. No. 37,515

Claims priority, application Japan, Jul. 3, 1978, 53-80694; Jul. 3, 1978, 53-80695; Sep. 26, 1978, 53-118203

Int. Cl.[3] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 21 Claims

1. A virus-inactivated glycoprotein from human urine which stimulates human bone marrow cells to form colonies of granulocytes and which has the following physical and chemical properties:

(a) molecular weight: 75,000 to 90,000 dalton as determined by gel filtration;

(b) solubility: soluble in water, slightly soluble in chloroform, and insoluble in ethyl alcohol and acetone;

(c) specific optical rotation: $[\alpha]_D^{20}=0\pm40$ (0.25% aqueous solution);

(d) pH: 5.0–6.0 (1% by weight aqueous solution);

(e) isoelectric point: pH 4.7±0.2;

(f) thermostability: on being heated at 60°±0.5° C. for 30 minutes in 1% aqueous solution, the stimulating function on the proliferation and differentation of the human granulocyte is completely lost;

(g) electrophoresis: the relative mobility is 0.25 in the electrophoresis using sodium dodecyl sulfate-polyacrylamide gel;

(h) infrared absorption: characteristic absorption at the following wave numbers (cm^{-1}): 3600–3200 (strong absorption), 1700–1600 (strong absorption), 1550 (medium absorption), 1430–1380 (medium absorption), and 1150–1000 (broad band);

(i) color reaction: colors characteristic of saccharides are produced by the α-naphthol-sulfuric acid reaction, indole-sulfuric acid reaction, anthrone-sulfuric acid reaction and phenol-sulfuric acid reaction; colors characteristic of polypeptide linkage and amino acids are produced by the Lowry-Folin's reaction and by the ninhydrin reaction after hydrolysis with hydrochloric acid;

(j) constituent amino acids of the protein moiety: proline, aspartic acid, threonine, serine, glutamic acid, glycine,

alanine, valine, methionine, isoleucine, leucine, tyrosine, phenylalanine, lysine, histidine, triptophan and arginine;
(k) color and shape: substantially white and amorphous;
(l) sugar composition of the polysaccharide moiety: 10.0–13.0% by weight in terms of glucose of neutral sugars, 3.0–7.0% by weight of sialic acids and 1% by weight of other amino sugars;
(m) weight ratio of protein to polysaccharide: 75–85: 13.0–20.0; and
(n) elementary analysis: 42.3–47.3% of carbon, 5.7–7.8% of hydrogen, 9.6–14.3% of nitrogen, 34.4–39.4% of oxygen and 0.2% or less of sulfur.

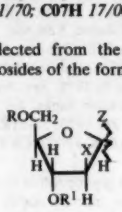
4,230,698

2-SUBSTITUTED ARABINOFURANOSYL NUCLEOSIDES AND NUCLEOTIDES

Miroslav V. Bobek, Williamsville; Alexander Bloch, Athol Springs, and Yung-Chi Cheng, Buffalo, all of N.Y., assignors to Research Corporation, New York, N.Y.

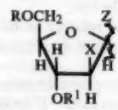
Filed May 12, 1978, Ser. No. 905,529
Int. Cl.³ A61K *31/70*; **C07H** *17/00, 15/12, 17/00*
U.S. Cl. 424—180 **12 Claims**

1. A compound selected from the group consisting of arabinofuranosyl nucleosides of the formula



wherein Z is a pyrimidinyl-1 or purinyl-9 moiety, X is selected from the group consisting of amino, azido, and hydrocarbylamino of 1 to 7 carbon atoms, and each of R and R^1 is selected from the group consisting of hydrogen, acetyl, propionyl, butyryl, valeryl, isovaleryl, hexanoyl, heptanoyl, octanoyl, nonanoyl, undecanoyl, lauroyl, benzoyl, phenylacetyl, phenylpropionyl, o-, m-, and p-methylbenzoyl, β-cyclopentylpropionyl, and dihydrocinnamoyl, and acid addition salts thereof.

10. A composition in dosage unit form comprising an arabinofuranosyl nucleoside of the formula



wherein Z is a pyrimidinyl-1 or purinyl-9 moiety, X is selected from the group consisting of amino, azido, and hydrocarbylamino of 1 to 7 carbon atoms, and each of R and R^1 is selected from the group consisting of hydrogen, acetyl, propionyl, butyryl, valeryl, isovaleryl, hexanoyl, heptanoyl, octanoyl, nonanoyl, undecanoyl, lauroyl, benzoyl, phenylacetyl, phenylpropionyl, o-, m-, and p-methylbenzoyl, β-cyclopentylpropionyl, and dihydrocinnamoyl, said nucleoside being either in the free base form or in the form of a pharmaceutically acceptable acid addition salt, and a sterile, compatible, pharmaceutical carrier for said nucleoside.

4,230,699

HEXURONYL HEXOSAMINOGLYCANE SULFATE AND RELATED THERAPEUTICAL USES

Fernando Fussi, Lesmo, and Gianfranco Fedeli, Milan, both of Italy, assignors to Hepar Chimie S.A., Fribourg, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,540
Claims priority, application United Kingdom, Aug. 10, 1977, 33615/77
Int. Cl.² A61K *71/31*; **C07H** *1/08*; **C12P** *19/06*
U.S. Cl. 424—181 **3 Claims**

1. Hexuronyl hexosaminoglycane sulfate, consisting essentially of:

Hexosamines	29 ± 3%
Huronic acids	27 ± 3%
(Organic) SO_4 =	27 ± 4%
Acetyl groups	7 ± 1%
Sodium	10 ± 2%

such that the molar ratio of huronic acids: hexosamine:sulfate:acetyl:sodium is 1:1.2:2:1.2:3

PM (chromatography by exclusion on gel): 8.000–16.000

Specific rotary power

$$[\alpha]_D^{20} = -30° / -15°$$

Electrophoresis on cellulose acetate (buffer:pyridine-acetic-acid-water = 1:10:229, pH 4.5 and development with toluidine blue): one main band with electrophoretic mobility $U = 1.90–1.95 \times 10^{-4}\ cm^2 v^{-1} s^{-1}$

I.R. spectrum: characteristic bands are observed at 1740, 1647, 1555, 1375, 1235 and 1050 cm^{-1}.

solubility: soluble in water, in diluted mineral acids and diluted fixed alkalies but insoluble in ethanol.

2. A pharmaceutical composition, comprising a carrier and as the active ingredient the product of claim 1 in the dosage of 100–200 mg/day.

4,230,700

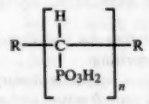
METHODS FOR INHIBITING MOBILIZATION OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

Marion D. Francis, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 677,113, Apr. 15, 1976, abandoned, which is a continuation of Ser. No. 582,573, Jun. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 361,354, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 260,939, Jun. 8, 1972, abandoned. This application Dec. 7, 1977, Ser. No. 858,302
Int. Cl.² A61K *31/66, 31/59*
U.S. Cl. 424—204 **21 Claims**

1. A method of treating Paget's disease comprising conjointly administering to an animal afflicted therewith therapeutic dosages of a phosphonate selected from the group consisting of:

I.

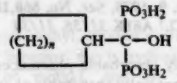


wherein each p is hydrogen or CH_2OH and n is an integer of from 3 to 10:

II.

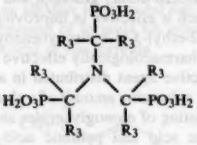
wherein R_1 is hydrogen, alkyl containing from 1 to about 20 carbon atoms, alkenyl containing from 2 to about 20 carbon atoms, phenylethenyl, benzyl, halogen, hydroxyl, amino, dimethylamino, diethylamino, $-CH_2COOH$, $-CH_2PO_3H_2$, $CH(PO_3H_2)(OH)$, or $-[CH_2C(PO_3H_2)_2]_nH$ wherein n is 1 to 15, R_2 is hydrogen, lower alkyl, amino, benzyl, halogen, hydroxyl, $-CH_2COOH$, $-CH_2PO_3H_2$, or $-CH_2CH_2PO_3H_2$;

III.



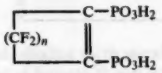
wherein n is an integer of from 3 to 9;

IV.



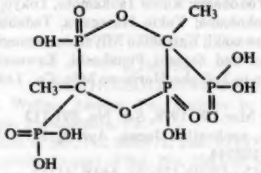
wherein each R_3 is hydrogen or lower alkyl;

V.

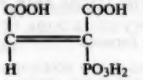


wherein n is an integer of from 2 to 4;

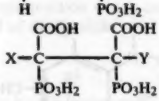
VI.



VII.

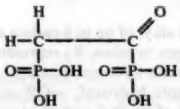


VIII.

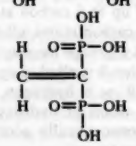


wherein X and Y are each hydrogen or hydroxy;

IX.



X.



and the pharmaceutically acceptable salts thereof; and (2) from about 100 I.U. to about 50,000 I.U. of a Vitamin-D active antirachitic compound.

2. A method of treating osteoporosis comprising conjointly administering to an aminal afflicted therewith therapeutic dosages of a phosphonate selected from the group consisting of:

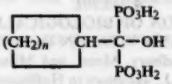
I.

wherein each P is hydrogen or CH_2CH and n is an integer of from 3 to 10:

II.

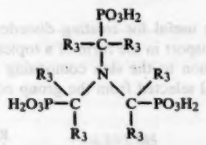
wherein R_1 is hydrogen, alkyl containing from 1 to about 20 carbon atoms, alkenyl containing from 2 to about 20 carbon atoms, phenylethenyl, benzyl, halogen, hydroxyl, amino, dimethylamino, diethylamino, $-CH_2COOH$, $-CH_2PO_3H_2$, $CH(PO_3H_2)(OH)$, or $-[CH_2C(PO_3H_2)_2]_nH$ wherein n is 1 to 15, R_2 is hydrogen, lower alkyl, amino, benzyl, halogen, hydroxyl, $-CH_2COOH$, $-CH_2PO_3H_2$, or $-CH_2CH_2PO_3H_2$;

III.



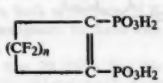
wherein n is an integer of from 3 to 9:

IV.



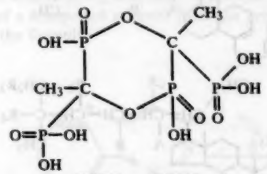
wherein each $P_3$is hydrogen or lower alkyl;

V.

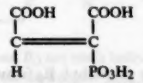


wherein n is an integer of from 2 to 4;

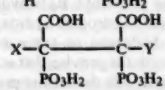
VI.



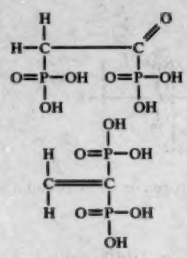
VII.



VIII.



wherein X and Y are each hydrogen or hydroxy;



IX.

X.

and the pharmaceutically acceptable salts thereof, and (2) from about 100 I.U. to about 50,000 I.U. of a Vitamin-D active antirachitic compound.

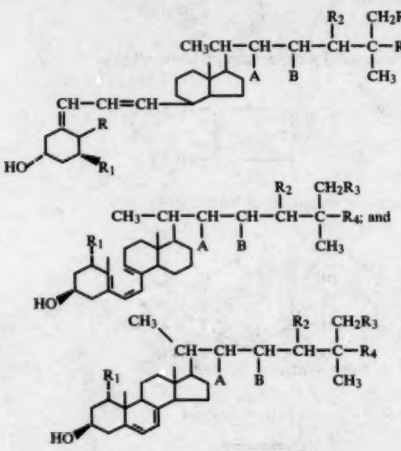
4,230,701

ADMINISTRATION OF BIOLOGICALLY ACTIVE VITAMIN D_3 AND VITAMIN D_2 MATERIALS

Michael F. Holick, Sudbury, Mass., and Milan R. Uskokovic, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 21, 1979, Ser. No. 22,393
Int. Cl.[3] A61K *31/59*
U.S. Cl. 424—236 6 Claims

1. A composition useful for treating disorders due to decreased calcium transport in the form of a topical preparation suitable for application to the skin comprising a therapeutic amount of a material selected from the group consisting of:



wherein R is methylidene or methyl; R_2 is hydrogen, hydroxy or methyl; R_1, R_3 and R_4 are hydrogen, hydroxy or halogen; A and B are individually hydrogen or taken together form a carbon to carbon bond; with the proviso that at least one of R_1, R_2, R_3 or R_4 is hydroxy and with the further proviso that when A and B form a carbon to carbon bond, R_2 is methyl, and a suitable inert carrier for topical preparation.

4,230,702

READILY ENTERALLY ABSORBABLE PHARMACEUTICAL COMPOSITIONS OF PER SE POORLY ENTERALLY ABSORBABLE PHARMACOLOGICALLY ACTIVE AGENTS

Theodor Eckert, and Fritz H. Kemper, both of Muenster, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 868,187
Int. Cl.[3] A61K *31/56, 31/34*
U.S. Cl. 424—242 18 Claims

1. A readily enterally absorbable pharmaceutical composition of a per se poorly enterally absorbable pharmacologically-active agent selected from the group consisting of (1) a steroid selected from the group consisting of pregn-4-ene-3,20-dione or a pregna-4,6-diene-3,20-dione, gestagen and medrogestone and (2) an agent which is effective in improving the capillary strength comprising 2-ethyl-3-(4-hydroxybenzoyl) benzofuran, which comprises a pharmacologically effective amount of the pharmacologically-active agent distributed in a vehicle comprising an absorption enhancing amount of a glyceride selected from the group consisting of monoglycerides and diglycerides of oleic acid, stearic acid and palmitic acid and mixtures thereof.

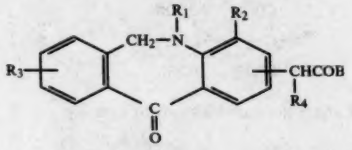
4,230,703

11-OXODIBENZ(B,E)AZEPINES

Yasushi Suzuki, Yokohama; Kunio Tsukamoto, Tokyo; Nobuyoshi Minami, Yokohama; Yukio Hasegawa; Tadaharu Watanabe, both of Kawasaki; Katsuhiko Miyasaka, Atsugi; Takashi Mikami, Tokyo, and Satoshi Funakoshi, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 891,112
Claims priority, application Japan, Apr. 1, 1977, 52-36065; Sep. 12, 1977, 52-108744
Int. Cl.[3] C07D *223/20;* A61K *31/55*
U.S. Cl. 424—244 30 Claims

1. A compound of the formula

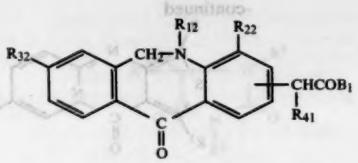


(I)

wherein R_1 represents alkyl of up to 6 carbon atoms, R_2 represents hydrogen, halogen or nitro, R_3 represents hydrogen or halogen, and R_4 represents hydrogen or alkyl of up to 6 carbon atoms; and B represents hydroxyl, —OR'_{104} or —NHR'_{105} wherein R'_{104} is alkyl of up to 6 carbon atoms, mono- or dihydroxy alkyl of up to 6 carbon atoms, alkoxy-alkyl in which each of the alkoxy and alkyl groups have up to 6 carbon atoms, or 2,2-dimethyl-1,3-dioxolan-5-yl alkyl of up to 6 carbon atoms in the alkyl group, and R'_{105} is hydrogen, hydroxyl, amino, alkyl of up to 6 carbon atoms or hydroxy alkyl of up to 6 carbon atoms, or a pharmaceutically acceptable salt of the compound wherein B is hydroxyl.

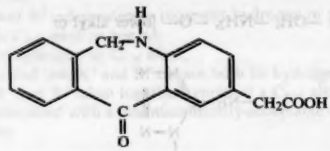
30. A pharmaceutical composition having analgesic end/or anti-inflammatory activity which comprises,

(A) as an active ingredient, a therapeutically effective amount of a compound selected from the group consisting of (1) a compound of the formula



(I-b)

wherein R_{12} is methyl, ethyl or n-propyl, R_{22} is hydrogen, chlorine or bromine, R_{32} is hydrogen or chlorine, R_{41} is hydrogen or methy, and B_1 represents hydroxyl, —OR"$_{104}$ or —NHR"$_{105}$ in which R"$_{104}$ is methyl, ethyl, hydroxyethyl or 2,2-dimethyl-1,3-dioxolan-5-yl methyl, and R"$_{105}$ is hydrogen, methyl or hydroxyl; (2) an alkali metal salt, an alkaline earth metal salt or an aluminum salt of said compound of formula I-b wherein B_1 is hydroxyl; (3) a compound of the formula



(II);

an alkali metal, alkaline earth metal or aluminum salt of said compound of formula II; and (5) an alkyl ester of said compound of formula II in which the alkyl group contains up to 6 carbon atoms, and

(B) a non-toxic pharmaceutically acceptable carrier or excipient.

4,230,704

ISOTHIAZOLIDIN-3-ONES

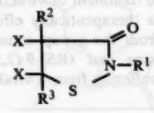
Ernest D. Weiler, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 804,971, Jun. 9, 1977, which is a continuation-in-part of Ser. No. 336,650, Feb. 28, 1973, abandoned. This application Apr. 20, 1979, Ser. No. 31,796

Int. Cl.[3] **A01N** *43/80;* **C07D** *275/02*

U.S. Cl. 424—248.51 **4 Claims**

1. A biocidal composition which comprises an inert carrier and a compound of the formula



wherein

R^1 is

(a) a hydrogen atom;

(b) an unsubstituted alkyl group having 1 to 18 carbon atoms;

(c) a substituted alkyl group having up to 18 carbon atoms which is substituted with one substituent selected from the group consisting of hydroxyalkyl, haloalkyl, cyanoalkyl, alkylaminoalkyl, dialkylaminoalkyl phenylalkylaminoalkyl, phenylaminoalkyl, carboxyalkyl, carbalkoxyalkyl, alkoxyalkyl, phenyloxyalkyl, alkylthioalkyl, phenylthioalkyl, isothiazolonylalkyl, and haloalkoxyalkyl, carbamoxyalkyl, morpholinalkyl, piperidinoalkyl and pyrrolidonylalkyl;

(d) a cycloalkyl group having a 3 to 6 carbon atom ring and up to 12 carbon atoms;

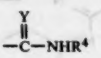
(e) an unsubstituted aralkyl group having up to 10 carbon atoms;

(f) a phenylalkyl group having up to 10 carbon atoms wherein one of the hydrogen atoms on either the phenyl group or the alkyl chain is replaced by a substituent selected from the group consisting of halogen, nitro, (C_1–C_4) alkyl and (C_1–C_4) alkoxy;

(g) an unsubstituted phenyl or naphthyl group;

(h) a phenyl or naphthyl group which is substituted with one substituent selected from the group consisting of halogen, cyano, nitro, (C_1–C_4) alkyl, (C_1–C_4) alkoxy, (C_1–C_4) alkylphenylamino, (C_1–C_4) carbalkoxy and sulfonyl; or

(i) a carbamoyl group of the formula



wherein Y is an oxygen or a sulfur atom and R^4 is an unsubstituted alkyl group having 1 to 18 carbon atoms, an alkylsulfonyl group having 1 to 4 carbon atoms, a phenylsulfonyl group having up to 10 carbon atoms, a phenylalkylsulfonyl group having up to 10 carbon atoms, a phenylalkyl group having up to 10 carbon atoms, or a carbalkoxyalkyl group having up to 4 carbon atoms in each alkyl moiety;

R^2 is a halogen atom or an unsubstituted (C_1–C_4) alkyl group;

R^3 is a halogen atom or an unsubstituted (C_1–C_4) alkyl group; and

X is a halogen atom.

4,230,705

6-PHENYL-1,2,4-TRIAZOLO[4,3-b]PYRIDAZINES AND THEIR USES IN TREATING ANXIETY

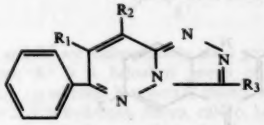
George R. Allen, Jr., Old Tappan, N.J.; John W. Hanifin, Jr.; Daniel B. Moran, both of Suffern, N.Y., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 22, 1976, Ser. No. 725,597

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/50;* **C07D** *237/14*

U.S. Cl. 424—250 **2 Claims**

1. The method of meliorating anxiety in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1, R_2, and R_3 are each individually selected from the group consisting of hydrogen and alkyl having up to four carbon atoms with the first proviso that when R_1 and R_2 are both hydrogen then R_3 may not be methyl and with the second proviso that when R_2 and R_3 are both methyl then R_1 may not be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,230,706

ANTIHYPERTENSIVE QUINAZOLINE COMPOUNDS

Isamu Maruyama, Minoo; Shunji Aono, and Junki Katsube, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

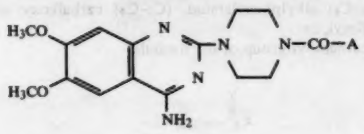
Filed Mar. 19, 1979, Ser. No. 21,776

Claims priority, application Japan, Mar. 29, 1978, 53-37141

Int. Cl.³ A61K *31/505*

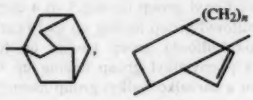
U.S. Cl. 424—251 **9 Claims**

1. A compound of the formula:

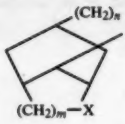


[I]

wherein A is



wherein n is an integer of 1 or 2, or



wherein X is O or CH_2, and n and m are independently an integer of 1 or 2, and its non-toxic pharmaceutically acceptable salts.

9. An antihypertensive composition comprising a compound as claimed in claim 1 or its pharmaceutically acceptable salts in an antihypertensively-effective amount, and a pharmaceutically acceptable carrier.

4,230,707

OXO-PYRIDO[1,2-A]THIENOPYRIMIDINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

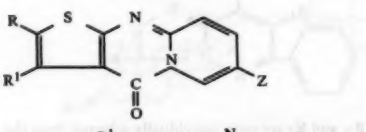
Francis J. Tinney; David T. Connor; Wiaczeslaw A. Cetenko; Joseph J. Kerbleski, and Roderick J. Sorenson, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

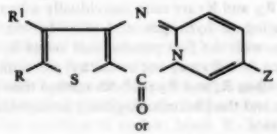
Filed Aug. 27, 1979, Ser. No. 70,227

Int. Cl.² C07D *495/14;* **A61K** *31/505*

U.S. Cl. 424—251 **71 Claims**

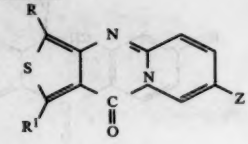
1. A compound of the formulae



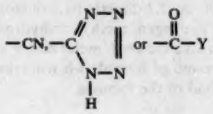


or

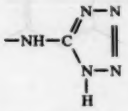
-continued



and salts thereof, wherein R and R^1 are hydrogen, lower alkyl, chloro, bromo, phenyl, or x-substituted phenyl where x is lower alkyl, chloro, fluoro, or lower alkyl —O— and Z is



wherein Y is —OH, $-NH_2$, —O— lower alkyl or



71. A method for treating allergic conditions in mammals which comprises administering the pharmaceutical compositions of claim 70.

4,230,708

THERAPEUTIC APPLICATION OF (S) -OR (RS)-9-(2, 3-DIHYDROXYPROPYL) ADENINE FOR USE AS ANTIVIRAL AGENTS

Erik De Clercq, Leuven, Belgium, and Antonin Holy, Prague, Czechoslovakia, assignors to Stichting Rega V.Z.W., Leuven, Belgium and Ceskoslovenska Akademie Ved., Prague, Czechoslovakia, part interest to each

Filed Oct. 20, 1978, Ser. No. 952,983

Claims priority, application Netherlands, Oct. 20, 1977, 7711513

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **2 Claims**

1. A method for the treatment of viral diseases which comprises administering a therapeutically effective amount of a compound selected from the group consisting of (S)-9-(2,3-dihydroxypropyl)adenine and (RS)-9-(2,3-dihydroxypropyl-)adenine to a patient suffering from a viral disease.

4,230,709

METHOD OF TREATING ASTHMA WITH ALKYL, ALKYLIDENE AND ALKYLENE HYDANTOINS

William B. Jamieson, Woking; William J. Ross, Lightwater; Robin G. Simmonds, Wokingham, and John P. Verge, Henley-on-Thames, all of England, assignors to Lilly Industries Limited, London, England

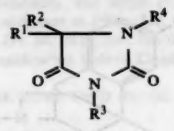
Filed May 14, 1979, Ser. No. 39,074

Claims priority, application United Kingdom, May 23, 1978, 21353/78

Int. Cl.³ A61K *31/445, 31/415;* **C07D** *471/04, 233/58*

U.S. Cl. 424—256 **2 Claims**

1. A method of preventing an asthmatic attack in a mammal susceptible to asthmatic attacks which comprises administering an antiasthmatically effective amount of a compound of the formula:



wherein R^1 is methyl, R^2 is hydrogen or methyl; or R^1 and R^2 taken together either represent a C_{4-6} alkylene group or a group of formula:

wherein

R^5 and R^6 independently represent hydrogen or methyl;

R^3 is C_{1-6} alkyl or benzyl;

R^4 is hydrogen or C_{1-6} alkyl;

provided that R^2 and R^4 cannot both be hydrogen;

or R^1 and R^4 taken together represent a C_{2-4} alkylene group, associated with a pharmaceutically-acceptable carrier therefor.

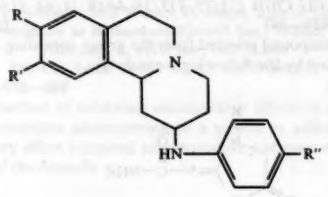
4,230,710

AMIDE DERIVATIVES OF 2-SUBSTITUTED ANILINO-HEXAHYDROBENZO[A]QUINOLIZINES, AND METHODS OF TREATING HYPERTENSION EMPLOYING THEM

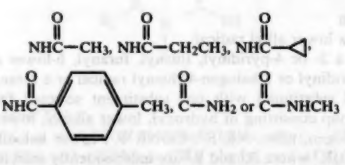
Herbert J. Havera, Edwardsburg, Mich., and Wallace G. Strycker, Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 23, 1978, Ser. No. 953,356
Int. Cl.³ A61K *31/47*; C07D *455/06*
U.S. Cl. 424—258 **20 Claims**

1. 2-substituted anilino-hexahydrobenzo[a]quinolizines of the formula:

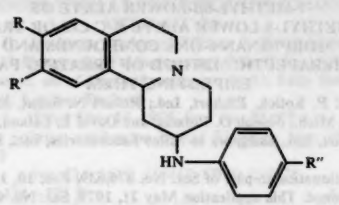


wherein R and R′ are independently H or OCH_3 and R″ is

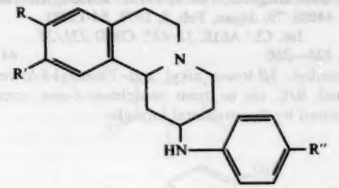


and pharmacologically acceptable, non-toxic acid addition salts thereof.

14. A method of treating hypertension in an individual requiring such treatment which method comprises administering to said individual an effective amount of a compound of the formula:



wherein R and R′ are independently H or OCH_3 and R″ is



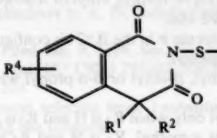
4,230,711

FUNGICIDAL N-SUBSTITUTED 4,4-DIALKYL HOMOPHTHALIMIDES

Stephen D. Ziman, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 31, 1979, Ser. No. 8,200
Int. Cl.² A61K *31/47*; C07D *217/24*
U.S. Cl. 424—258 **10 Claims**

1. A compound of the formula



wherein R^1 and R^2 are independently alkyl groups of 1 to 6 carbon atoms; R^3 is a haloalkyl group of the formula $C_mY_{(m-1)}X_{(m+2)}$ wherein X is fluoro, chloro, bromo or iodo and m=1 or 2; Y is hydrogen, fluoro, chloro, bromo or iodo; R^4 is hydrogen, an alkyl group of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, nitro, hydroxy, alkoxyalkyl of 2 to 6 carbon atoms, fluoro, bromo, chloro or iodo.

7. A fungicidal composition comprising a fungicidally effective amount of a compound defined in claim **1** and a biologically inert carrier.

8. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidaily effective amount of a compound defined in claim **1**.

4,230,712
7-METHYL-8β-LOWER ALKYL OR 7-METHYL-8-LOWER ALKYL B/C CIS OR TRANS MORPHINAN-6-ONE COMPOUNDS AND THERAPEUTIC METHOD OF TREATING PAIN EMPLOYING THEM

Michael P. Kotick, Elkhart, Ind.; Robert N. Schut, Edwardsburg, Mich.; Joseph O. Polazzi, and David L. Leland, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

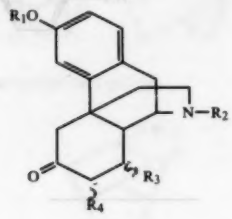
Continuation-in-part of Ser. No. 876,639, Feb. 10, 1978, abandoned. This application May 21, 1979, Ser. No. 40,664

Claims priority, application Canada, Dec. 12, 1978, 317750; Israel, Dec. 18, 1978, 56245; Fed. Rep. of Germany, Jan. 9, 1979, 2900644; Mexico, Jan. 9, 1979, 7636; France, Jan. 25, 1979, 79 01967; United Kingdom, Feb. 6, 1979, 7904030; Australia, Feb. 8, 1979, 44089/79; Japan, Feb. 8, 1979, 54-12883

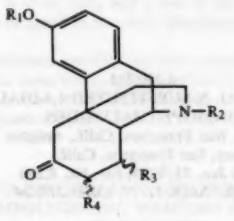
Int. Cl.[3] **A61K** *31/485;* **C07D** *221/28*

U.S. Cl. 424—260 **44 Claims**

1. 7-methyl, 8β-lower alkyl and 7-methyl-8-lower alkyl substituted B/C cis or trans morphinan-6-one compounds characterized by the structural formula:



I



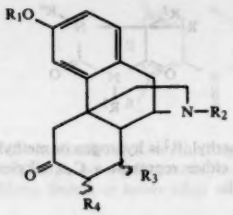
wherein R_1 is H or methyl, R_2 is cyclopropylmethyl or cyclobutylmethyl, R_3 is H, methyl, ethyl or n-propyl and R_4 is H or methyl, provided that:

A. when the molecule is in the B/C cis configuration and R_2 is cyclobutylmethyl,
   i. R_3 is β-methyl, β-ethyl or β-n-propyl when R_1 and R_4 are H,
   ii. R_1 is methyl only when R_4 is H and R_3 is β-methyl, and
   iii. when R_4 is α-methyl, R_1 is H and R_3 is β-methyl or β-ethyl,

B. when the molecule is in the B/C cis configuration and R_2 is cyclopropylmethyl,
   i. R_3 is β-methyl and R_4 is H or α-methyl when R_1 is methyl, and
   ii. R_3 is H and R_4 is α-methyl when R_1 is H; and

C. when the molecule is in the B/C trans configuration, R_1 is H and R_2 is cyclopropylmethyl,
   i. R_3 is either α-methyl or H, and
   ii. R_4 is β-methyl.

23. A therapeutic method of treating pain in an individual requiring such treatment which comprises administering to such individual an effective amount of a compound characterized by the formula:



wherein R_1 is H or methyl, R_2 is cyclopropylmethyl or cyclobutylmethyl, R_3 is H, methyl, ethyl or n-propyl and R_4 is H or methyl, provided that:

A. when the molecule is in the B/C cis configuration and R_2 is cyclobutylmethyl,
   i. R_3 is β-methyl, β-ethyl or β-n-propyl when R_1 and R_4 are H,
   ii. R_1 is methyl only when R_4 is H and R_3 is β-methyl, and
   iii. when R_4 is α-methyl, R_1 is H and R_3 is β-methyl or β-ethyl;

B. when the molecule is in the B/C cis configuration and R_2 is cyclopropylmethyl,
   i. R_3 is β-methyl and R_4 is H or α-methyl when R_1 is methyl, and
   ii. R_3 is H and R_4 is α-methyl when R_1 is H, and

C. when the molecule is in the B/C trans configuration, R_1 is H and R_2 is cyclopropylmethyl,
   i. R_3 is either α-methyl or H, and
   ii. R_4 is β-methyl.

4,230,713
HETEROCYCLIC TETRAHYDRO-1-ALKYL-4-OXO-1H-IMIDAZOL-2-YLIDENE UREA AND PHENYL ESTERS OF TETRAHYDRO-1-ALKYL-4-OXO-1H-IMIDAZOL-2-YLIDENE CARBAMIC ACID COMPOUNDS

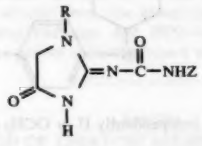
Thomas M. Bare, West Chester, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jan. 19, 1979, Ser. No. 4,675

Int. Cl.[3] **C07D** *213/75, 233/28;* **A61K** *31/44, 31/415*

U.S. Cl. 424—263 **22 Claims**

1. A compound selected from the group consisting of those represented by the following formula (I):



(I)

wherein

R is a lower alkyl radical;

Z is a 2- or 4-pyridinyl, thienyl, furanyl, 6-lower alkyl-2-pyridinyl or 2-halogen-4-thienyl radical or a furanyl radical substituted with one substituent selected from the group consisting of hydroxyl, lower alkoxy, lower alkyl, halogen, nitro, NR^1R^2, $CONR^1R^2$, lower haloalkyl and CO_2R^1 where R^1 and R^2 are independently selected from hydrogen and lower alkyl;

or a pharmaceutically acceptable acid-addition salt thereof.

14. A pharmaceutical composition for the treatment of anxiety comprising a therapeutically effective amount of a compound of claim **1** in combination with a pharmaceutically acceptable carrier or diluent therefor.

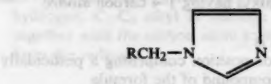
4,230,714

IMIDAZOLE THERAPEUTIC AGENTS

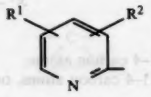
Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,807
Claims priority, application United Kingdom, Aug. 15, 1978, 33456/78
Int. Cl.[2] A61K *31/44*; C07D *401/06*; A61K *31/47*
U.S. Cl. 424—263 14 Claims

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R is 2-quinolyl or a pyridyl moiety of the formula:



wherein R^1 is hydrogen, halogen or alkyl of 1–4 carbon atoms; and R^2 is alkyl of 1–4 carbon atoms, or a group of the formula $—OR^3$ wherein R^3 is hydrogen, alkyl of 1–4 carbon atoms, allyl, prop-2-ynyl, cycloalkylmethyl having 3–6 carbon atoms in the cycloalkyl group, or benzyl in which the phenyl moiety is unsubstituted on the ring or is monosubstituted with halogen, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms; with the proviso that said $—OR^3$ is always a group located at the 3- or 5-positions of the pyridine ring.

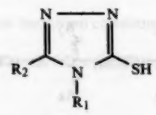
4,230,715

1,2,4-TRIAZOLE-3-THIOLS AS ANTISECRETORY AGENTS

William L. Albrecht, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Sep. 4, 1979, Ser. No. 71,814
Int. Cl.[2] A61K *31/41*, *31/62*; C07D *249/12*
U.S. Cl. 424—269 5 Claims

1. A method of achieving antisecretory effects in a patient which comprises administering to a patient in which an antisecretory effect is desired an antisecretory amount of a compound of the formula



wherein

R_1 is H or NH_2;

R_2 is C_{1-6} straight or branched chain alkyl; $—CH_2OH$; $—(CH_2)_n—O—(CH_2)_m—CH_3$; phenyl; or $—(CH_2)_pNH_2$;

n is 1–3;

m is 0–3; and

p is 1–5;

or, for those compounds of basic character, a pharmaceutically acceptable acid addition salt thereof.

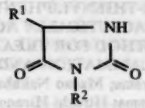
4,230,716

TREATING IMMEDIATE HYPERSENSITIVITY CONDITIONS WITH 3,5-DISUBSTITUTED HYDANTOIN DERIVATIVES

William B. Jamieson, Woking; William J. Ross, Lightwater; Robin G. Simmonds, Wokingham, and John P. Verge, Henley-on-Thames, all of England, assignors to Eli Lilly Industries Limited, London, England

Filed May 14, 1979, Ser. No. 39,077
Claims priority, application United Kingdom, May 23, 1978, 21354/78
Int. Cl.[3] A61K *31/415*; C07D *233/78*
U.S. Cl. 424—273 R 6 Claims

5. A method of prophylactic chemotherapy of immediate hypersensitivity conditions such as asthma which comprises administering to a human susceptible to such conditions a prophylactically effective amount of a compound of the formula



wherein R^1 is phenyl, C_{1-4} hydroxyalkyl or carboxy C_{1-4} alkyl and R^2 is C_{1-6} alkyl.

4,230,717

INDOMETHACIN-ANTIHISTAMINE COMBINATION FOR GASTRIC ULCERATION CONTROL

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Patricia A. Brown, Menlo Park, Calif., and Joan Vernikos, London, England

Continuation-in-part of Ser. No. 850,504, Nov. 10, 1977. This application Dec. 29, 1978, Ser. No. 974,476
Int. Cl.[3] A61K *31/40*
U.S. Cl. 424—274 2 Claims

1. A process for reducing gastric ulceration caused by the administration of indomethacin to a mammal under stress, which comprise administering to said mammal an antihistamine drug selected from the group consisting of metamide and cimetidine, said antihistamine drug being administered at the rate of about 0.2 to 1.5 g for each 0.025 to 0.200 g dose of indomethacin.

4,230,718

1-SUBSTITUTED-3,4-EPOXYPYRROLIDINES

David A. Walsh, and William J. Welstead, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Jan. 9, 1979, Ser. No. 2,150
Int. Cl.[3] C07D *295/02*, *209/00*
U.S. Cl. 424—274 22 Claims

1. A compound selected from 1-substituted-3,4-epoxypyrrolidines having the formula:

wherein R is loweralkyl, cycloalkyl having 3 to 9 carbon atoms or phenylalkyl wherein the alkyl moiety includes radicals of up to 4 carbon atoms and the acid addition salts thereof.

8. A method for the prevention or amelioration of diabetes complications consisting of cataracts in a diabetic animal

which comprises administering to said animal an effective amount of a compound having the formula:

wherein R is loweralkyl, cycloalkyl having 3 to 9 carbon atoms or phenylalkyl wherein the alkyl moiety includes radicals of up to 4 carbon atoms and the pharmaceutically acceptable addition salts thereof.

4,230,719

NOVEL 2-[4-(3-METHYL-2-THIENYL)PHENYL]PROPIONIC ACID AND PHARMACEUTICALLY ACCEPTABLE SALT THEREOF AND METHOD FOR TREATING SYMPTOMS OF INFLAMMATION AND PAIN

Tsutomu Kodama, Toyama; Masao Nakabayashi, Namerikawa; Isao Watanabe, Toyama; Hiroshi Hirano, Oyabe; Norio Abe, Toyama; Katsufumi Tanaka, Toyama, and Hirotoshi Arai, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

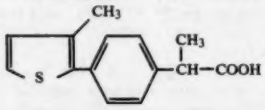
Continuation-in-part of Ser. No. 961,557, Nov. 17, 1978, abandoned. This application Aug. 31, 1979, Ser. No. 71,486

Claims priority, application Japan, Nov. 21, 1977, 52-138943; May 10, 1979, 54-56331

Int. Cl.[3] **C07D** *333/24;* **A01K** *31/38*

U.S. Cl. 424—275 **7 Claims**

1. 2-[4-(3-methyl-2-thienyl)phenyl]propionic acid represented by the formula,



or a pharmaceutically acceptable salt thereof.

4,230,720

HETEROCYCLIC DITHIOPHOSPHATES OR PHOSPHONATES AS INSECTICIDES AND ACARICIDES

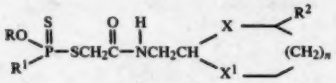
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 30, 1979, Ser. No. 62,202

Int. Cl.[3] **A01N** *43/24;* **C07D** *319/04*

U.S. Cl. 424—278 **6 Claims**

1. Compounds having the structural formula



wherein

R is alkyl having 1–4 carbon atoms;

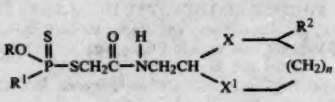
R^1 is alkyl having 1–4 carbon atoms, or alkoxy having 1–4 carbon atoms;

R_2 is hydrogen or alkyl having 1–4 carbon atoms;

X is oxygen;

X^1 is oxygen and n is 1.

5. The method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of a compound of the formula



wherein

R is alkyl having 1–4 carbon atoms;

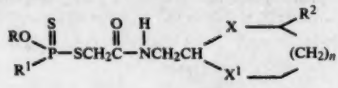
R^1 is alkyl having 1–4 carbon atoms, or alkoxy having 1–4 carbon atoms;

R^2 is hydrogen or alkyl having 1–4 carbon atoms;

X is oxygen;

X^1 is oxygen and n is 1.

6. The pesticidal composition comprising a pesticidally effective amount of a compound of the formula



wherein

R is alkyl having 1–4 carbon atoms;

R^1 is alkyl having 1–4 carbon atoms, or alkoxy having 1–4 carbon atoms;

R^2 is hydrogen or alkyl having 1–4 carbon atoms;

X is oxygen;

X^1 is oxygen and

n is 1 and an inert carrier therefor.

4,230,721

BICYCLIC PROSTAGLANDINS

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

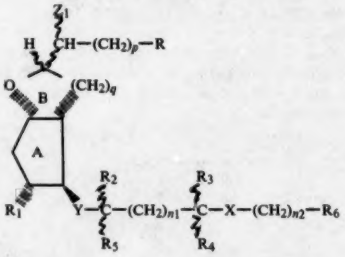
Continuation of Ser. No. 859,703, Dec. 12, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,148

Claims priority, application Italy, Dec. 31, 1976, 31041 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77

Int. Cl.[3] **A61K** *31/557;* **C07D** *307/935*

U.S. Cl. 424—285 **13 Claims**

1. A compound of formula (I)



(I)

wherein

R is COOR′ wherein R′ is selected from the group consisting of H, C_1-C_{12} alkyl and C_2-C_{12} alkenyl;

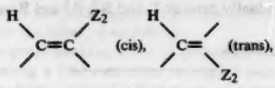
Z_1 is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

R_1 is selected from the group consisting of C_1-C_6 alkoxy and benzyloxy;

Y is a member selected from the group consisting of —CH-2—CH_2—,

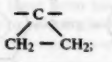


wherein Z_2 is hydrogen;

one of R_2 and R_5 is hydrogen or C_1-C_6 alkyl and the other is hydroxy, C_1-C_6 alkoxy, benzyloxy, or R_2 and R_5, taken together form an oxo group;

each of R_3 and R_4, which are the same or different, may be hydrogen, C_1-C_6 alkyl or fluorine or R_3 and R_4, taken together with the carbon atom to which they are linked, form the radical

or the radical



each of n_1 and n_2, which are the same or different, is zero or an integer of 1 to 6;

X is $-(CH_2)_m-$ wherein m is zero or 1;

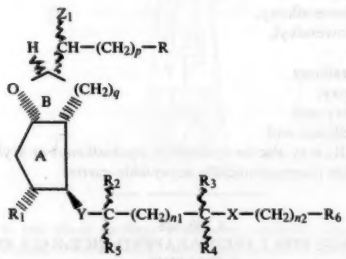
R_6 is a member selected from the group consisting of

(a') hydrogen;

(b') C_1-C_4 alkyl;

and the pharmaceutically or veterinarily acceptable salts thereof.

3. A compound of formula (I)



(I)

wherein

R is COOR' wherein R' is selected from the group consisting of H, C_1-C_{12} alkyl and C_2-C_{12} alkenyl;

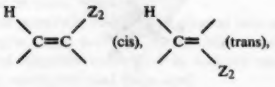
Z_1 is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

R_1 is selected from the group consisting of C_1-C_6 alkoxy and benzyloxy;

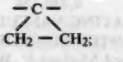
Y is a member selected from the group consisting of $-CH_2-CH_2-$



wherein Z_2 is hydrogen

one of R_2 and R_5 is hydrogen or C_1-C_6 alkyl, and the other is hydroxy, C_1-C_6 alkoxy, benzyloxy, or R_2 and R_5, taken together form an oxo group; each of R_3 and R_4, which are the same or different, may be hydrogen, C_1-C_6 alkyl or fluorine or R_3 and R_4, taken together with the carbon atom to which they are linked, form the radical

or the radical



each of n_1 and n_2, which are the same or different, is zero or an integer of 1 to 6;

X is a member selected from the group consisting of —O—, —S— and $-(CH_2)_m-$ wherein m is zero or 1;

R_6 is selected from the group consisting of phenyl, α-naphthyl and β-naphthyl, substituted or unsubstituted by one or more substituents selected from the group consisting of halogen, halo-C_1-C_6-alkyl, C_1-C_6 alkyl and C_1-C_6 alkoxy; and the pharmaceutically or veterinarily acceptable salts thereof.

4,230,722

DIHALOVINYLCYCLOPROPANETHIOLIC ACID ESTERS AND THEIR USE IN PEST CONTROL

Roger Malherbe, Muttenz; Daniel Bellus, Riehen, and Laurenz Gsell, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

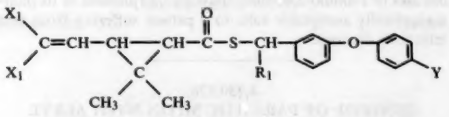
Filed Jun. 18, 1979, Ser. No. 49,367

Claims priority, application Switzerland, Jun. 26, 1978, 6935/78; May 11, 1979, 4414/79

Int. Cl.³ A01N *37/14*; C07C *153/023*

U.S. Cl. 424—301 **10 Claims**

1. A cyclopropanecarboxylic acid ester of the formula



wherein X_1 represents fluorine, chlorine or bromine, R_1 represents hydrogen, methyl, ethynyl or cyano, and Y represents hydrogen, fluorine, chlorine or bromine.

4,230,723

COMBATING PLANT BACTERIA WITH ACYLHALOGENOMETHYL THIOCYANATES

Siegfried Oeckl, Cologne; Hans Scheinpflug, Leverkusen, and Peter Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

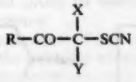
Filed May 10, 1979, Ser. No. 37,627

Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823658

Int. Cl.² A01N *9/18*

U.S. Cl. 424—302 **8 Claims**

1. A method of combating phytopathogenic bacteria comprising applying to plants or seeds an acylhalogenomethyl thiocyanate of the formula



in which

R is alkyl with up to 6 carbon atoms, thienyl, phenyl, naphthyl, or phenyl substituted by halogen, hydroxy, alkyl with 1 to 4 carbon atoms, alkoxy with up to 4 carbon atoms, nitro or phenyl,

X is halogen,

Y is halogen or hydrogen, the compound being applied in an amount effective to combat said bacteria but not substantially to affect plants or seed.

4,230,724

METHOD OF TREATING VASCULARIZATION OF THE EYE WITH FLURBIPROFEN

Charles A. Cooper, and Michael V. W. Bergamini, both of Irvine, Calif., assignors to Allergan Pharmaceuticals, Inc., Irvine, Calif.

Filed Jul. 16, 1979, Ser. No. 57,608
Int. Cl.[3] A61K *31/19*
U.S. Cl. 424—317 9 Claims

1. A method of treating trauma-induced vascularization of the cornea comprising topically administering to the eye an effective, vascularization-inhibiting amount of Flurbiprofen or a pharmaceutically acceptable salt thereof.

4,230,725

ANTIVIRAL AGENT

Masaru Fukui, Takarazuka; Shigeo Ogino, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Kao Soap Company, Limited, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 883,743, Mar. 6, 1978, abandoned. This application Sep. 5, 1978, Ser. No. 939,682
Claims priority, application Japan, Mar. 10, 1977, 52/26730
Int. Cl.[3] A61K *31/13*
U.S. Cl. 424—325 1 Claim

1. A method for the treatment of infectious diseases caused by herpes virus which comprises administering an amount pharmaceutically effective for the treatment of said infectious diseases of 1-amino-2,4-ethanobicyclo[3,3,1]nonane or its pharmaceutically acceptable salts to a patient suffering from said infectious diseases.

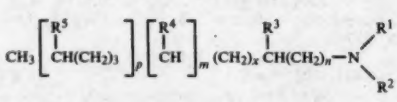
4,230,726

CONTROL OF PARASITIC MITES WITH ALKYL AMINES

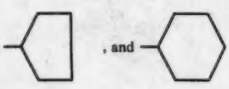
William F. Fisher, Kerrville, Tex.; Malcolm J. Thompson, Baltimore, Md.; Fred C. Wright, Kerrville, Tex., and William E. Robbins, Silver Springs, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 29, 1979, Ser. No. 53,475
Int. Cl.[3] A01N *33/02, 43/84, 43/40, 37/18*
U.S. Cl. 424—325 5 Claims

1. A method of controlling scabies mites and other parasitic mites comprising applying to said mites a miticidally effective amount of a compound of the general formula



wherein R^1 and R^2 are selected individually from the group consisting of H, lower alkyl,



x is a number from 5 to 17, n is a number from 1 to 5, m and p are individually zero or 1, and R^3, R^4 and R_5 are individually

H or lower alkyl.

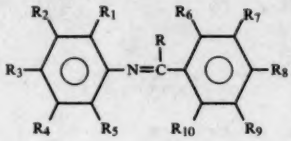
4,230,727

COMPOSITIONS AND METHOD OF TREATMENT

George W. Nuss, Jr., Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 839,960, Oct. 6, 1977. This application Apr. 2, 1979, Ser. No. 26,334
Int. Cl.[2] A61K *31/19, 31/135*
U.S. Cl. 424—330 27 Claims

1. A method of inhibiting or preventing cellular proliferation in mammals which comprises administering to a mammal in need of treatment an effective amount of a compound of the formula:



(I)

where:

R is hydrogen or alkyl;

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} may be the same or different and are

hydrogen,
alkyl,
nitro,
amino,
haloloweralkoxy,
haloloweralkyl,
halo,
loweralkoxy,
hydroxy,
carboxy and
carbalkoxy; and

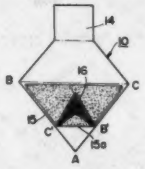
R_3 and R_8 may also be cycloalkyl, cycloalkenyl or aryl in a suitable pharmaceutically acceptable carrier.

4,230,728

PACKAGE FOR LAVER-WRAPPED RICE-BALL OR "ONIGIRI"

Akitomi Tezuka, 5-11 Kinuta 3-chome, Setagaya-ku, Tokyo, Japan

Filed Aug. 31, 1978, Ser. No. 938,349
Claims priority, application Japan, Sep. 30, 1977, 52-130740
Int. Cl.[2] B65D *81/32*
U.S. Cl. 426—115 5 Claims



1. A packing sheet for temporarily hand-packing and completely enclosing a rice-ball of generally triangular shape together with a sheet of dry laver of generally equilateral triangular shape while substantially isolating the former from the

latter to protect the latter against moisture until the former is wrapped with the latter, comprising:

a moisture-proof packing sheet of generally diamond shape folded along a fold extending through a pair of opposite angles to form a pair of folded sheets of generally equilateral triangular shape with the dry laver contained in between;

a pull-out sheet extending from the top one of the unfolded angle portions of one of said folded sheets and folded back toward the fold of said packing sheet, said rice ball being positioned on said pull-out sheet and said pull-out sheet extending a sufficient margin from beneath and beyond said rice ball, to facilitate its manual pull out when the packing sheet is unfolded said rice ball being substantially separated from said dry laver;

the folded back pull-out sheet exposing a portion of the laver contained between said pair of folded sheets; the folded and unfolded angle portions being further folded together with edges of each of said angle portions overlapping each other so that the exposed portion of laver is also folded and sticks to a portion of the rice ball to facilitate a separation of said pull-out sheet from said rice ball to position said rice ball directly on said dry laver upon unfolding said packing sheet prior to consumption.

4,230,729

ONE PIECE, COLLAPSIBLE PACKAGE

Fred L. Hoelzel, Jr., 21 Greenmam Ave., Westerly, R.I. 02891

Filed Mar. 16, 1979, Ser. No. 21,101

Int. Cl.[2] B65D *85/00, 5/10, 5/50, 5/56*

U.S. Cl. 426—124 **5 Claims**

1. A one piece package containing contents comprising a pre-cooked, frozen lobster hermetically sealed in a boilable plastic bag, said package comprising:

(a) a generally trapezoidal shaped bottom panel having a central longitudinal crease running the length thereof,

(b) a first generally rectangular shaped side panel hingedly connected to said bottom panel having hingedly connected end flaps,

(c) a generally trapezoidal shaped top panel corresponding in shape and size substantially to said bottom panel and hingedly connected to said first side panel, having a central longitudinal crease running the length thereof and having hingedly connected end flaps and a plurality of hingedly connected window flaps which open inwardly to form one or more windows,

(d) a second generally rectangular shaped side panel corresponding in shape and size substantially to said first side panel and hingedly connected to said top panel, having hingedly connected end flaps, and

(e) a generally rectangular shaped panel hingedly connected to said second side panel and adhesively connected to said bottom panel;

said inwardly opening window flaps being pushed by the contents of the package such that their edges contact the side panels, thereby defining fairly rigid inner walls which hold the contents of the package, provide lateral support for the contents in the package and ensure that the contents are centered in the package, and

said longitudinal creases on said top and bottom panels being parallel to each other thereby allowing the package to be collapsible when the contents of the package are removed and the end flaps are not engaged and further allowing the package to more readily conform to the shape of the contents.

4,230,730

LEAVENING ACID COMPOSITION

Robert M. Lauck, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 741,265, Nov. 12, 1976, abandoned.

This application Jan. 19, 1979, Ser. No. 6,420

Int. Cl.[3] A21D *10/02, 2/02*

U.S. Cl. 426—128 **11 Claims**

1. A leavening acid composition comprising:

(a) a sodium aluminum phosphate derivative selected from the group consisting of a potassium modified 1:3:8 sodium aluminum phosphate, the calcium modified derivatives thereof prepared by contacting a slurry of said potassium modified sodium aluminum phosphate with a calcium compound followed by granulating the product while drying and mixtures thereof; in combination with

(b) a slow alkali metal acid pyrophosphate having a doughnut dough rate of reaction of less than 30% CO_2 evolved after two minutes and less than 35% evolved CO_2 after ten minutes at 27° C.

4,230,731

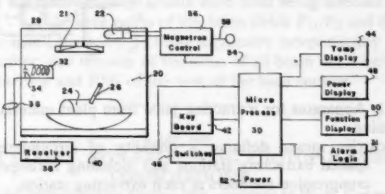
MICROWAVE COOKING METHOD AND CONTROL MEANS

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 25, 1978, Ser. No. 909,461

Int. Cl.[2] A01K *43/00*

U.S. Cl. 426—233 **7 Claims**



1. A method for microwave cooking a comestible to a predetermined cooked temperature using a temperature instrument having a temperature sensitive element carried by a probe and a temperature received responsive thereto:

(a) placing a comestible having an embedded temperature probe within a chamber;

(b) exposing the comestible to microwave energy to cook said comestible and receiving an indicated temperature from said probe;

(c) interrupting the application of microwave energy to the comestible when the indicated temperature received from said probe reaches a predetermined intermediate value, less than said predetermined cooked temperature;

(d) permitting the indicated temperature of the comestible received from said probe to equilibrate to an average comestible temperature;

(e) resuming the application of microwave energy to the comestible when the indicated temperature received from said probe stabilizes to substantially the average comestible temperature; and

(f) controlling the appliation of said microwave energy in step (e) in response to said stabilized average temperature.

4,230,732
METHODS OF CHILLING POULTRY

William L. Paradise, Jr., Dunwoody, Ga., and Mark L. Byars, Berkeley Heights, N.J., assignors to Airco, Inc., Montvale, N.J.

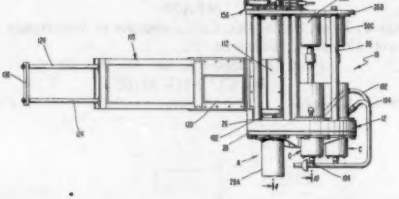
Filed Jan. 24, 1979, Ser. No. 6,150
Int. Cl.[2] A23L 1/315; B65B 25/00
U.S. Cl. 426—393 4 Claims

1. A process for chilling poultry comprising the steps of: removing parts of the poultry comprising the giblets from said poultry, chilling said poultry without said giblets to a temperature of about 32°–35° F. without freezing said poultry, freezing said giblets while removed from said poultry such that the average temperature of said giblets is reduced to about 28° F. or lower; and reinserting said frozen giblets into the breast cavity of said chilled poultry to thereby provide refrigeration to said chilled, but unfrozen, poultry to enable extended shelf life thereof without freezing portions of said poultry other than said giblets.

4,230,733
METHODS AND APPARATUS FOR EXTRACTING JUICE FROM PLANT MATERIAL

Sydney E. Tilby, Victoria, Canada, assignor to Intercane Systems, Inc., Ontario, Canada

Filed Jan. 4, 1979, Ser. No. 985
Int. Cl.[2] A23L 1/28
U.S. Cl. 426—429 23 Claims



1. Apparatus for extracting juice from plant material comprising:

carrier means defining a plurality of circumferentially spaced extracting stations and including a reciprocable compression members at each extracting station;

a rotary head mounted for rotation relative to said carrier means and including a plurality of cells alignable with said extracting stations, said cells each being arranged to carry a charge of plant material;

indexing means for rotating said head in step-by-step fashion to sequentially align said cells with successive ones of said extracting stations;

means for extending said compression members into compressing relationship with plant material in said cells to express juice from such material; and

conduit means connected to at least some of said extracting stations for introducing imbibition liquid ahead of the respective compression members to be pressed through the plant material during extension of such compression members.

18. Apparatus for expressing juice from plant fibers comprising a cell for receiving a charge of plant material, and a movable member arranged for entering said cell and compressing the plant material therein to express juice, said movable member comprising a compression surface in the form of an apertured screen which admits passage of juice, said movable member having an interior passage for conducting juice from said screen to a discharge opening, the apertures of said screen being tapered so as to become wider in a direction away from said cell, to facilitate removal of plant solids.

23. A method of extracting juice from plant material comprising the steps of:

rotating a rotary head in step-by-step fashion such that circumferentially spaced plant material-carrying cells thereof become aligned successively with expressing stations on a stationary carrier;

moving movable members at said expressing stations into compressing relationship with plant material in said cells at each successive step of said head, to express juice from the plant material;

introducing imbibition liquid into one of said stations, thereafter moving the movable member associated with said one station into compressing relationship with plant material at said station while forcing said imbibition liquid through such plant material to mix the latter with plant juice, and introducing the resultant liquid/juice mixture into another of stations which receives each charge of plant material before said one station; and

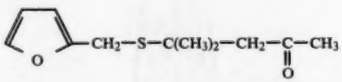
discharging exhausted plant material from its associated cell at a discharge station.

4,230,734
FLAVORING WITH 4-METHYL-4-FURFURYLTHIO-PENTANONE-2

Reinerus J. C. Kleipool, Amersfoort, Netherlands, assignor to Naarden International, N.V., Naarden-Bussum, Netherlands

Continuation of Ser. No. 776,763, Mar. 11, 1977, abandoned.
This application Dec. 8, 1978, Ser. No. 967,596
Claims priority, application Netherlands, Mar. 15, 1976, 7602689
Int. Cl.[2] A23L 1/231
U.S. Cl. 426—535 3 Claims

1. A process for amplifying or changing the flavor of a food product, comprising adding to the ingredients of said food product a thiopentanone compound of the formula



in an amount ranging between about 0.005 to about 100 ppm.

4,230,735
PROCESS FOR PRODUCING QUICK-COOKING NOODLES

Kiyotaka Yoshida, Tokorozawa; Yoshio Hatanaka, Akikawa; Kesayoshi Kudo, Tokyo, and Takao Aoki, Tokyo, all of Japan, assignors to Myojo Foods Company, Limited, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,142
Claims priority, application Japan, Mar. 29, 1977, 52/34950
Int. Cl.[2] A23L 1/16
U.S. Cl. 426—557 14 Claims

1. In a process for producing quick-cooking noodles which comprises mixing a noodle formulation comprising a first flour selected from the group consisting of wheat flour, buckwheat flour, and mixtures thereof, salt, egg powder, water and at least one noodle dough conditioner, rolling the mixture to give a continuous noodle sheet, slitting the sheet into noodle strands, steaming the strands, cutting them into a predetermined length, drying them and packaging the resulting noodles as a clump together with flavoring agents and additives, the improvement which comprises that the noodle formulations further integrally contain at least one starch flour and at least one edible fat or one edible oil or mixtures thereof, and that after the noodle strands have been steamed and before they are dried, they are cooled to a temperature of from about 30° to about 60° C., wherein said starch flour is used in an amount of from about 30% to about 40% by weight based on the total weight of the

flour ingredients which consist of said first flour and said starch flour; and wherein said edible fat, oil or mixtures thereof are used in amount of from about 0.4% to about 4% by weight based on the total weight of said first flours and said starch flours.

4,230,736

INTAKE LIMITING LIQUID FEED SUPPLEMENT FOR RUMINANTS

Norman L. Betz, St. Louis, Mo.; Kent J. Lanter, Belleville, Ill., and Danny L. Williams, Manchester, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,288
Int. Cl.[3] A23K *1/02*
U.S. Cl. 426—601 20 Claims

1. An intake limiting liquid feed supplement for ruminants comprising a liquid carbohydrate medium containing an intake limiting amount of a chlorinated fat having a reacted chlorine content of between about 0.2 and 3.7% by weight of said fat.

4,230,737

MARGARINE FAT

Henning Heider, Bargteheide, and Theophil Wieske, Hamburg, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,309
Claims priority, application United Kingdom, Nov. 10, 1977, 46842/77
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—607 3 Claims

1. Margarine fat having a difference in dilation value at 15° and 25° C. of at least 100 and a dilation value at 35° C. of no more than 100, comprising at least 95 percent of fats containing at least 80 percent by weight of fatty acid residues with 18 carbon atoms, part of these fats being hardened and part of the non-hardened fats being interesterified with hardened fats which contain no more than 55 percent of trans-acids, such that the margarine fat contains 20–60 percent by weight of interesterified fats, and 80–40 percent by weight of non-interesterified fats the non-interesterified fats containing both non-hardened fats and fats hardened to a trans-content of 50–70 percent, the weight ratio between hardened and non-hardened fats in the non-interesterified part being from 1:1 to 1:5 and the weight ratio between the hardened and non-hardened fats in the interesterified part being from 4:1 to 1:3.

4,230,738

PROCESS FOR PREPARING TEXTURED PROTEIN CONCENTRATE

Michael Shemer, Haifa, Israel; Richard E. McDonald, Westerville, and Anthony H. Chen, Columbus, both of Ohio, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 613,090, Sep. 15, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,002
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—656 11 Claims

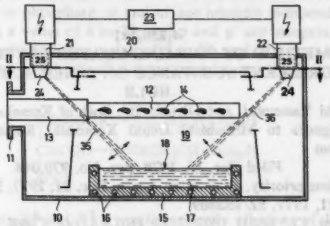
1. In the process for preparing a textured protein concentrate from protein extrudate containing water soluble constitutents by the aqueous solvent extraction of said water soluble constituents from said extrudate, the improvement wherein said protein extrudate has a density of between about 85 to 150 grams per liter on a dry weight basis and the extraction is carried out at a pH of between about 4.4 and 6.0 and at a temperature above about 65° C., whereby a textured protein concentrate having improved meat-like texture and bland flavor is produced.

4,230,739

METHOD OF EVAPORATING MELTS OF ALLOYS OF METALS HAVING DIFFERENT VAPOR PRESSURES

Hans Aichert; Walter Dietrich, both of Hanau am Main; Alfred Hauff, Bruchköbel; Peter Sommerkamp, Hanau am Main, and Herbert Stephan, Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 963,236
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812285
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—42 9 Claims



1. Method for evaporating melts of alloys of metals of different vapor pressures from a continuously fed, large-area evaporating crucibles by direct bombardment of the bath surface with focused electron beams which are periodically deflected according to a pattern wherein the alloy material is deposited on a plurality of substrates which are disposed in a field above the evaporating crucible with local adaptation of the energy density to the thermal economy of the melt bath which comprises deflecting at least one electron beam onto at least two substantially rectangular beam fields F_1, F_2 . . . , guiding the electron beam in each of these fields through a line raster at a frequency of at least 100 Hz, shifting periodically from one to the other field at a shift frequency of at most 5 Hz, the dwell time of the electron beam within each field being selected at T_1, T_2, . . . ; the area ratios of the beam fields F_1, F_2 and the relative dwell times T_1, T_2 being adjustable independently of one another, and the sum of the areas of all beam fields being between 10% and 80% of the area of the bath surface.

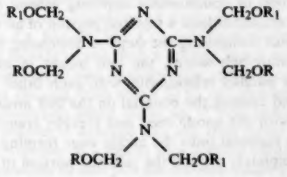
4,230,740

HEAT STABLE, NON-YELLOWING PHOTOPOLYMER COMPOSITIONS

Joseph D. Moyer, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 882,021, Feb. 28, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,627
Int. Cl.[3] B05D *3/06*; C08F *8/18*
U.S. Cl. 427—54.1 2 Claims

1. The process of forming a non-yellowing, cured polythioether heat stable at 450° F. for at least 15 minutes which comprises admixing a composition comprising a polythiol, a photoinitiator and a polyene of the formula:



wherein R are all the same member of the group consisting of

$$CH_2{=}CHCH_2{-};\quad CH_2{=}CR'\overset{O}{\overset{\|}{C}}OCH_2CH_2{-}\text{ and}$$

$$CH_2{=}CR'\overset{O}{\overset{\|}{C}}OCH_2CH_2CH_2CH_2{-};$$

R_1 is $-CH_3$ or R, and R' is $-CH_3$ or H and thereafter exposing said composition to UV radiation.

4,230,741

METHOD OF FORMING COATED LAYER OF FLUORESCENT SUBSTANCE ON INNER SURFACE OF BULB

Hitoshi Yamazaki, and Hiroshi Ito, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1978, Ser. No. 970,044

Claims priority, application Japan, Dec. 21, 1977, 52/153808; Dec. 21, 1977, 52/153809

Int. Cl.³ B05D *3/02, 7/22;* **H01J** *61/46;* **C09K** *11/02*

U.S. Cl. 427—67 **9 Claims**

1. In a method of forming a coated layer of a fluorescent substance on the inner surface of a bulb which comprises coating a suspension incorporating a fluorescent substance, an organic water soluble polymer, a surfactant, a fine powdery aluminum oxide as binder, and a bulb heat-treating step of burning out said organic water soluble polymer and said surfactant from the coated layer, the improvement which comprises incorporating boric acid and hydrogen peroxide or a precursor thereof in said suspension.

4,230,742

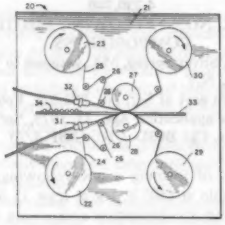
METHOD FOR APPLYING MATERIAL TO A SUBSTRATE

Gerhart P. Klein, Manchester, Mass., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 684,129, May 7, 1976, abandoned, which is a continuation of Ser. No. 527,682, Nov. 27, 1974, abandoned. This application Dec. 12, 1977, Ser. No. 860,036

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—79 **14 Claims**



1. A method of continuously applying a band of material completely around at least a selected portion of an anode riser for a capacitor comprising the steps of dispensing material on two continuous belt means, the belt means in an opposed, substantially parallel relationship with each other at at least one point and causing the material on the belt means to come in contact with the anode riser and thereby transfer at least some of the material onto the anode riser forming a band of material completely around the selected portion of the anode riser.

4,230,743

PROCESS FOR PRODUCING PRESSURE-SENSITIVE COPYING PAPER

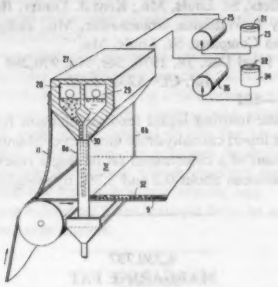
Hiroaki Nakamura; Shiro Kaneko, and Takeshi Watanabe, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 810,700, Jun. 28, 1977, abandoned. This application Feb. 16, 1978, Ser. No. 878,353

Claims priority, application Japan, Jun. 28, 1976, 51-76743

Int. Cl.² B41M *5/12;* **B41L** *1/00*

U.S. Cl. 427—146 **20 Claims**



1. A process for producing a pressure-sensitive copying paper which compries

forming a single-layer, free-fall, vertical curtain of a coating solution containing microcapsules as a main component, said microcapsules containing a color former therein, and

coating said coating solution onto a continuously running web by passing said running web through said single-layer, free-fall, vertical curtain.

4,230,744

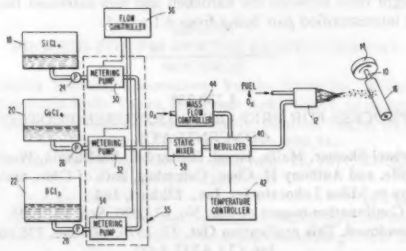
SYSTEM FOR DELIVERING MATERIALS TO DEPOSITION SITE ON OPTICAL WAVEGUIDE BLANK

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 885,215, Mar. 10, 1978, Pat. No. 4,173,305. This application Feb. 21, 1979, Ser. No. 13,281

Int. Cl.² G02B *5/14, 1/10*

U.S. Cl. 427—163 **4 Claims**



1. The method of forming an optical waveguide blank, comprising the steps of:

providing a vapor deposition means for receiving source material vapor and directing said vapor toward a starting member;

providing a starting member is proximate relation to said vapor deposition means for accumulating source material thereon;

providing glass forming source materials in liquid form;

delivering each of said liquids at individually controlled rates and in liquid form to a common site;

thoroughly intermixing said liquids;
nebulizing the intermixed liquids;
delivering the nebulized, mixed liquids to said vapor deposition means and;
depositing the materials in said nebulized, mixed liquids on said starting member to form said optical waveguide blank.

4,230,745

METHOD OF ENCAPSULATING A MOLDED CERAMIC MEMBER

Wolfgang Betz, Munich, and Axel Rossmann, Karlsfeld, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1978, Ser. No. 930,725

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737209

Int. Cl.[2] **C23C** *11/00, 13/00;* **B05D** *3/00*

U.S. Cl. 427—255.4 **4 Claims**

1. In a method for encapsulating a molded member of ceramic, such as silicon ceramic for high-temperature isostatic pressing; the improvement comprising coating said molded member with a dense surface coating of Si melt; and thereafter exposing said coating to an N2 atmosphere at a temperature in the range of about 800° C. to 1400° C. until the Si coating is converted into a Si3N4 coating.

4,230,746

FOAMING COMPOSITION FOR TEXTILE FINISHING AND COATINGS

Roop C. Nahta, Charlotte, N.C., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 21,564, Mar. 16, 1979, which is a division of Ser. No. 897,378, Apr. 18, 1978, Pat. No. 4,198,316. This application Sep. 24, 1979, Ser. No. 77,997

Int. Cl.[3] **B05D** *3/02;* **C08J** *9/28, 9/30*

U.S. Cl. 427—373 **10 Claims**

1. The process of applying a coating to a substrate which comprises; foaming a composition containing from about 50 to about 70 parts by weight of a synthetic resin coating agent; and from about 2 to about 8 parts by weight of an acid type catalyst; from about 5 to about 14 parts by weight of the expansion mixture for foaming coatings which comprises a foamable mixture of:

(a) 15 to 53 weight % of a compound having the formulae:

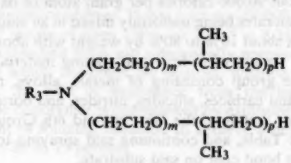
$$R—(OCH_2CH_2)_nOSO_3H^-M^+$$

and/or

$$R^1—(CH_2CH_2O)_{n+1}SO_3H^-M^+$$

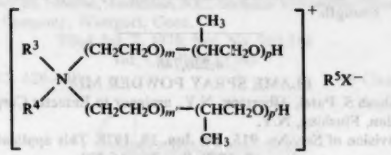
wherein R is alkyl of 6 to 18 carbon atoms or hydroxyalkyl of 6 to 18 carbon atoms; R^1 is hydrogen, alkyl of 6 to 18 carbon atoms or phenoxy substituted with not more than two alkyl groups each having 1 to 23 carbon atoms; n is an integer having a value of 0 to 10; and M is sodium, potassium, calcium, ammonium or an alkyl- or alkyloxy-amine radical of 1 to 6 atoms;

(b) 5 to 42 weight % of a compound having the formulae:



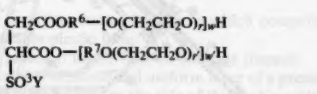
and/or

-continued



wherein R^3 is alkyl of 6 to 20 carbon atoms; R^4 and R^5 are independently alkyl of 1 to 4 carbon atoms; X is sulfate, halide or phosphate; m and m' are integers independently having a value of 4 to 20; and p and p' are integers independently having a value of 0 to 20; and

(c) 5 to 45 weight % of a compound having the formula:



wherein R^6 and R^7 are independently alkylene of 4 to 22 carbon atoms; r and r' are independently integers each having a value of 0 to 15; w and w' are integers independently having a value of 0 to 1; and y is sodium or potassium; and from about 2 to about 26 parts of diluent per part of coating agent; expanding said mixture up to about 1,000%; contacting the substrate and the resulting foam to provide a layer of foam on said substrate; and drying said foam coated substrate at a temperature between about 175° F. and about 390° F. for a period of from about 30 seconds to about 60 minutes.

4,230,747

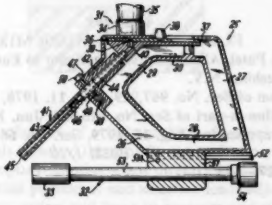
FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 915,938, Jun. 15, 1978. This application Aug. 15, 1979, Ser. No. 66,691

Int. Cl.[3] **B05D** *1/10*

U.S. Cl. 427—423 **9 Claims**



1. A method of producing an adherent bond coat on a metal substrate which comprises,

flame spraying onto said metal substrate a powder mixture formed of agglomerates at least one metal silicide selected from the group consisting of disilicides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Co, and boron silicide and magnesium silicide mixed with a coating metal powder,

the average size of said agglomerates and said coating metal powder ranging from about 30 to 140 microns,

said agglomerates being made up of fine particles of said metal silicide of average size less than about 20 microns bound together in a matrix of a fugitive binder,

the composition of said powder mixture ranging from about 2% to 15% by weight of said silicide, with substantially the balance said coating metal powder,

and continuing said spraying to form an adherent bond coat on said substrate characterized by improved bond strength.

4,230,748

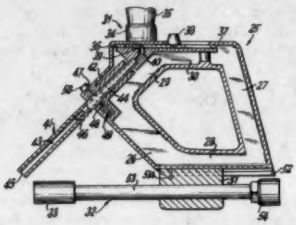
FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 915,729, Jun. 15, 1978. This application Aug. 15, 1979, Ser. No. 66,700

Int. Cl.³ B05D 1/10

U.S. Cl. 427—423 **10 Claims**



1. A method of producing an adherent bond coat on a metal substrate which comprises,

flame spraying onto said metal substrate a powder mixture formed of agglomerates of an oxidizable metal separately mixed with a coating metal powder,

the average size of said agglomerates and said coating metal powder ranging from about 20 to 140 microns,

said agglomerates being made up of fine particles of said oxidizable metal of average size less than about 20 microns bound together in a matrix of a fugitive binder,

said oxidizable metal being characterized by a negative free energy of formation of the oxide of at least 30,000 calories per gram atom of oxygen referred to 25° C. and a melting point above 350° C.,

the composition of said powder mixture ranging from about 2% to 15% by weight of said oxidizable metal, with substantially the balance said coating metal powder,

and continuing said spraying to form an adherent bond coat on said substrate characterized by improved bond strength.

4,230,749

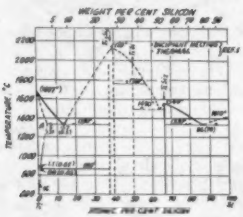
FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 967,919, Dec. 11, 1978, which is a continuation-in-part of Ser. No. 915,938, Jun. 15, 1978. This application Aug. 15, 1979, Ser. No. 66,875

Int. Cl.³ B05D 1/10

U.S. Cl. 427—423 **7 Claims**



1. A method of producing an adherent bond coat on a metal substrate which comprises,

flame spraying onto said metal substrate a powder mixture formed of agglomerates of at least one metal disilicide selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Re, Mn, and Co combined together with silicon and mixed with a coating metal powder,

said metal disilicide (MSi_2) and silicon when thermally fused together providing a eutectic phase of the binary MSi_2-Si,

the average size of said agglomerates and said coating metal powder ranging from about 30 to 140 microns,

said agglomerates being made up of fine particles of said metal disilicide and silicon of average size less than about 20 microns bound together in a matrix of a fugitive binder,

the composition of said powder mixture ranging from about 2% to 15% by weight of said metal disilicide and sufficient silicon in the range of about 2% to 15% by weight to provide a eutectic phase of said binary MSi_2-Si, with substantially the balance of said flame spray powder mixture being said coating metal powder, and continuing said spraying to form an inherent bond coat on said substrate characterized by improved bond strength.

4,230,750

METALLO-THERMIC POWDER

George Yurasko, Jr., Glencove, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 962,673, Nov. 21, 1978. This application Aug. 15, 1979, Ser. No. 66,876

Int. Cl.³ B05D 1/10

U.S. Cl. 427—423 **16 Claims**

1. A method of producing an adherent bond coat on a substrate which comprises, flame spraying onto said metal substrate a powder mixture formed of agglomerates of a metallo-thermic heat-generating composition mixed with a coating material,

said agglomerates of metallo-thermo heat-generating composition comprised essentially of fine particles of a reducible metal oxide formed from a metal characterized by a negative free energy of oxidation ranging up to about 60,000 calories per gram atom of oxygen referred to 25° C. intimately combined together by means of a thermally fugitive binder with fine particles of a strong reducing agent consisting essentially of a metal characterized by a negative free energy of oxidation referred to 25° C. of at least about 90,000 calories per gram atom of oxygen,

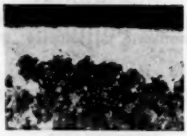
said agglomerates being uniformly mixed in an amount ranging from about 10% to 80% by weight with about 90% to 20% by weight of at least one coating material selected from the group consisting of metals, alloys, refractory oxides, and carbides, silicides, nitrides, and borides of the refractory metals of the 4th, 5th, and 6th Groups of the Periodic Table, and continuing said spraying to form an adherent bond coat on said substrate.

4,230,751

TREATING COMPOSITION, FORMING A MIXED-CARBIDE LAYER OF VA-GROUP ELEMENTS AND OF CHROMIUM ON A FERROUS-ALLOY SURFACE AND RESULTING PRODUCT

Noboru Komatsu; Tohru Arai, both of Toyoake, and Hironori Fujita, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota, Nagoya and Chuo Kenkyusho, Aichi, both of, Japan

Filed Aug. 8, 1978, Ser. No. 931,953
Claims priority, application Japan, Aug. 11, 1977, 52-95571
Int. Cl.[2] C23C *9/16;* C25D *3/66;* B32B *15/18*
U.S. Cl. 427—443.1 38 Claims



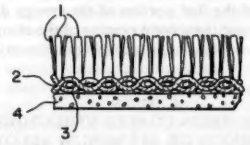
1. A treating material having as sole initial essential constituent ingredients:
   I. a member selected from the group consisting of boric acid and a borate and
   II. a combination selected from the group consisting of:
      A. a chromium oxide and at least one Va-Group element in metal or alloy form and
      B. chromium in metal or alloy form and at least one Va-Group element in oxide form.

4,230,752

CIGARETTE BURN PROOF ARTIFICIAL GRASS

Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 26, 1979, Ser. No. 33,479
Int. Cl.[3] A41G *1/00*
U.S. Cl. 428—17 26 Claims



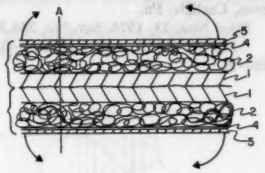
1. A cigarette burn proof artificial grass product, comprising: a pile fabric with twisted yarn comprised of a plurality of fibers made of an ethylene-vinyl acetate copolymer and having an elastic modulus of from 25,000 p.s.i. to 100,000 p.s.i. and a moment of inertia of from 1.06×10^{-10}in.^{4} to 8.33×10^{-9}in.^{4}, the fibers extending from and substantially perpendicular to a backing to which the fibers are secured, wherein the yarn is twisted at the part of emergence from the backing, and wherein the copolymer is cross-linked by exposure to an effective amount of ionizing radiation to achieve a gel content of from about 25 to 75 percent.

4,230,753

PRESSURE SENSITIVE COMPOSITE ARTICLE

Gregory M. Sheyon, Anderson, S.C., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 7, 1978, Ser. No. 922,718
Int. Cl.[2] B29C *3/00*
U.S. Cl. 428—40 16 Claims



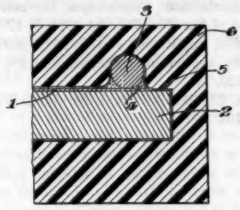
1. A pressure sensitive, composite article which comprises:
   (a) a heat bondable plastic film;
   (b) a backing attached to the film on one side thereof;
   (c) a substantially continuous and uniform layer of a pressure sensitive adhesive bonded to the side of the backing which is opposite the plastic film; and
   (d) a polymeric release liner attached to the adhesive layer opposite the side of said layer which is bonded to the backing, the liner having a melting point which is below the temperature at which the plastic film is heat bondable.

4,230,754

BONDING ELECTRONIC COMPONENT TO MOLDED PACKAGE

John P. Maher, Adams, Mass., and Elsa Kam-Lum, Amherst, N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 7, 1978, Ser. No. 958,598
Int. Cl.[2] H01L *23/28;* B32B *27/38*
U.S. Cl. 428—76 2 Claims



1. In the manufacture of a fully-molded electronic component having leads attached thereto, the steps of: applying a thin seal layer of an epoxy-reactive silane directly onto said component including that portion of said attached leads adjacent said component, then curing said layer to co-react said silane with said component and leads and form said seal, then subjecting said component with attached leads and said seal to a transfer molding operation to surround said component and said portion of attached leads in an epoxy package, said silane being chosen from the group consisting of gamma-aminopropyl trimethoxy silane, gamma-aminopropyl triethoxy silane, gamma-glycidoxypropyl trimethoxy silane, and gamma-glycidoxypropyl triethoxy silane and bonding said sealed component and leads to said epoxy package by reaction during said transfer molding operation.

2. A molded electronic component comprising an electronic network on a substrate with lead wires forming a unit, a sealing layer of epoxy silane or epoxy-reactive silane surrounding said unit and bonded thereto, and a molded epoxy package surrounding said unit and layer and bonded to said unit via said

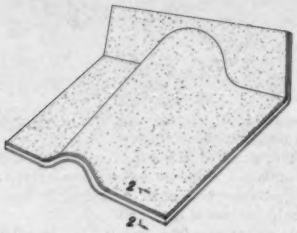
layer wherein said layer is cured prior to molding said epoxy package.

4,230,755

MOLDABLE UNITARY COMPOSITE CARPET STRUCTURE

Robert W. Morris, Shermans Dale, Pa., assignor to C. H. Masland & Sons, Carlisle, Pa.

Filed Nov. 23, 1976, Ser. No. 744,312
Int. Cl.[3] B32B *5/18;* **D04H** *11/00*
U.S. Cl. 428—95 **2 Claims**



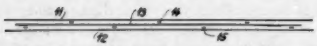
1. As a new article of manufacture, a flat unitary composite carpet structure having good fiberbond, tuftbind and sound deadening qualities and being capable of being heat molded permanently into nonplanar shape and also capable of having an underpad adhesively attached to its underside, comprising a textile fabric, a relatively thick layer of cured polyurethane foam adhered to the underside of the textile fabric, and a layer of coalesced polyethylene powder adhered to the underside of the layer of polyurethane.

4,230,756

RIBBED TICK WITH INSULATING FILLER

Sigurd S. Hansen, Fruens Boge, Denmark, assignor to Nordish Fjerfabrik Aktieselskab, Copenhagen, Denmark

Continuation of Ser. No. 513,464, Oct. 9, 1974, Pat. No. 4,137,111. This application Jan. 8, 1979, Ser. No. 1,747
Claims priority, application Denmark, Oct. 29, 1973, 5479/73; Jul. 5, 1974, 3620/74
Int. Cl.[3] B32B *1/06, 3/28, 7/10, 7/14*
U.S. Cl. 428—101 **3 Claims**



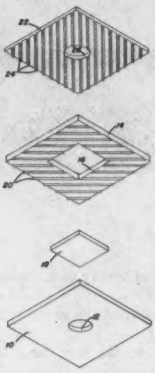
1. A ribbed tick adapted to be filled with a flexible insulating filler to form a pillow, quilt, feather bed or eiderdown comprising a top and a bottom sheet of textile material, the top and bottom sheets being connected at their edges, and a single intermediate sheet interposed between the top and the bottom sheet, the intermediate sheet being alternatingly connected to the inner surfaces of both the top and bottom sheets by a plurality of seams formed from layers of thermoplastic material, the seams between the intermediate sheet and the top sheet being parallel to and offset from the seams between the intermediate sheet and the bottom sheet so as to form a plurality of channels for containing said flexible insulating filler.

4,230,757

SONICALLY SECURING ARTICLES IN PLASTIC MOUNTS

James K. Toner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,623
Int. Cl.[2] B32B *3/10, 31/16*
U.S. Cl. 428—137 **11 Claims**



1. A method for securing an object having a predetermined thickness in a laminated mount, said method comprising the steps of:

placing the object in a recess of a first thermoplastic sheet, said recess having a depth greater than the object thickness;

covering the first sheet with a second thermoplastic sheet having a plurality of energy director elements projecting from one surface by a distance substantially equal to the difference between the object thickness and the recess depth such that (1) a first portion of the energy director elements engage the surface of the first sheet about the recess and (2) a second portion of the energy director elements are aligned with the recess and the object therein; and

applying compressive force and high frequency vibratory energy to the sheets, whereby thermoplastic material in the region of the first portion of the energy director elements melts and the second portion of the energy director elements moves into engagement with the object.

4,230,758

FLUORINE RESIN COATED STRUCTURE OF ALUMINUM OR ALUMINUM ALLOY

Shuzo Nagai; Seiji Watabe; Takao Ogino, and Koichi Okita, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 847,466, Oct. 31, 1977, abandoned, which is a continuation of Ser. No. 658,940, Feb. 17, 1976, abandoned. This application Aug. 6, 1979, Ser. No. 64,277
Claims priority, application Japan, Feb. 14, 1975, 50/19340
Int. Cl.[2] A47J *36/02;* **B32B** *3/00, 15/08, 15/20*
U.S. Cl. 428—141 **3 Claims**

1. A fluorine resin coated structure comprising:

(a) An aluminum or aluminum alloy substrate having fine raised and depressed portions on the surface thereof and wherein said surface is chemically or electrochemically etched;

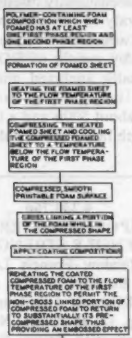
(b) an anodized layer of aluminum oxide formed on said surface; and

(c) A baked coating of a fluorine resin formed on top of the aluminum oxide coating, the entirety of said fluorine resin surface being in contact with the aluminum oxide coating and with said fluorine resin coating having a thickness of about 5 to about 100 microns, wherein the surface roughness of said coated structure is represented by an R_{max} value of about 5 to about 60(μ) and an R_z value of about 4 to about 50(μ).

4,230,759
PROCESS OF FORMING AN EMBOSSED SURFACE COVERING

William J. Kauffman, Lancaster, and George L. Lilley, Manheim, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 9, 1978, Ser. No. 932,346
Int. Cl.[3] B32B *3/30, 31/28*
U.S. Cl. 428—159 10 Claims


POLYMER-CONTAINING FOAM COMPOSITION WHICH WHEN FOAMED HAS AT LEAST ONE FIRST PHASE REGION AND ONE SECOND PHASE REGION
FORMATION OF FOAMED SHEET
HEATING THE FOAMED SHEET TO THE FLOW TEMPERATURE OF THE FIRST PHASE REGION
COMPRESSING THE HEATED FOAMED SHEET AND COOLING IT IN CONTACT WITH A COOLED ROLL SHEET TO A TEMPERATURE BELOW THE FLOW TEMPERATURE OF THE FIRST PHASE REGION
COMPRESSED, SMOOTH PRINTABLE FOAM SURFACE
CROSS-LINKING A PORTION OF THE FOAM WHILE IN THE COMPRESSED SHAPE
APPLY COATING COMPOSITIONS
REHEATING THE COATED COMPRESSED FOAM TO THE FLOW TEMPERATURE OF THE FIRST PHASE REGION TO PERMIT THE NON-CROSS-LINKED PORTION OF COMPRESSED FOAM TO RETURN TO SUBSTANTIALLY ITS PRE-COMPRESSED SHAPE THUS PROVIDING AN EMBOSSED EFFECT
PRODUCT

1. A process of forming an embossed surface covering, which process comprises:

(a) depositing a mechanically frothed foam or forming a chemically blown foam on a backing, at least a portion of said foam being capable of being cross-linked, the foam comprising at least one polymer and having at least a first phase region and a second phase region, both phase regions existing at least in the surface region of said foam;

(1) the first phase region exhibiting a flow temperature above room temperature and being present in the foam in an effective amount to hold the compressed shape of the foam in step (c) below,

(2) the second phase region remaining elastomeric at the flow temperature of the first phase region,

(b) heating the foam to a temperature at least equal to the flow temperature of the first phase region;

(c) compressing the heated foam sufficient to form a level print surface and cooling the foam in the compressed shape to a temperature below the flow temperature of the first phase region such that the first phase region holds the compression of the foam upon removal of the compressing force, thus forming a level, printable, compressed foam surface;

(d) cross-linking a portion of the foam while the foam is in the compressed shape; and

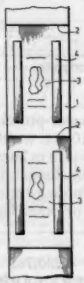
(e) reheating the resulting compressed foam to a temperature at least equal to the flow temprature of the first phase region to permit the noncross-linked portion of the compressed foam to return to substantially its precompressed shape.

10. An embossed surface covering produced according to the process of claim 1.

4,230,760
FOIL WEB FOR FILLING AUTOMATS WITH A REMOVAL APPARATUS

Eugene Schneider, Romerstr. 4, 6701 Altrip, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,568
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719450
Int. Cl.[2] B32B *3/02, 7/14;* B05D *5/00*
U.S. Cl. 428—195 3 Claims



1. A wrapping bag foil web to be used in a filling machine in association with removal rollers or belts juxtaposed to at least one of the sides of the web, said foil having applied thereto narrow spaced parallel stripes of pigmented material parallel to the longitudinal edges of the web, to impart thereto spaced roughened non-slip surfaces commensurate with the position of the rollers or belts.

4,230,761
COMPOSITE OF A HIGH NITRILE COPOLYMER ADHERED TO AN OLEFIN BASED POLYMER

William A. Watts, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 26, 1978, Ser. No. 872,405
Int. Cl.[2] B32B *27/08, 27/32, 27/30*
U.S. Cl. 428—215 9 Claims

1. A composite comprising a high nitrile copolymer of 55 to 95 mol percent of a nitrile monomer selected from the class consisting of acrylonitrile, methacrylonitrile and ethacrylonitrile, and the balance composed of butadiene or styrene and a monomer of alkyl acrylate or methacrylate where the alkyl radical contains from 2 to 10 carbon atoms adhered to an olefinic base polymer of simple olefins of 2 to 6 carbon atoms and an olefinic carboxylic acid of 3 to 8 carbon atoms with a two-phase block polymer adhesive comprising an elastomeric base block having at least two terminal nonelastomeric blocks, said elastomeric base block being the polymer of a conjugated diene of 4 to 8 carbon atoms and the nonelastomeric block being the polymer of a monomer selected from the class consisting of styrene, alpha-methylstyrene and vinyl toluene.

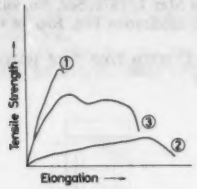
4,230,762
ASPHALT WATER-PROOFING MATERIAL

Hajime Iwasaki; Kuninori Mizuta, both of Tokyo; Yoshinori Kobayashi, Iwakuni; Tadayoshi Yoshikawa, Ohtake, and Kyouzi Muraoka, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries Ltd. and Mitsuboshi Sangyo Co., Ltd., both of Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,326
Claims priority, application Japan, Jul. 24, 1978, 53-89341
Int. Cl.[2] B32B *5/06*
U.S. Cl. 428—234 10 Claims

1. An asphalt water-proofing material comprising a composite material including a non-woven fabric layer made of long filaments of synthetic resin arranged in random fashion and a

woven or knitted fabric layer, said layers being connected together by needle-punching to form the integral composite material, and a petroleum asphalt saturating said composite material, said petroleum asphalt having softening point of 70°–120° C. and penetration of 10–60 at 25° C., said composite



material and/or asphalt water-proofing material having tensile strength of at least 6 kg/10 mm width in longitudinal direction and at least 4 kg/10 mm width in lateral direction at the time of 3% elongation thereof and elongation of at least 50%, thereby providing superior crumpling-resistant, shrinkage-resistant, restoring, crack-resistant or other fatigue-resistant properties.

4,230,763

OPEN WEAVE DRAPERY FABRIC IN ASSOCIATION WITH A SOLAR LIGHT-CONTROL FILM

Barry Skolnick, East Windsor, N.J., assignor to Saxon Industries, Inc., New York, N.Y. 10020

Filed Jan. 5, 1978, Ser. No. 867,148

Int. Cl.[2] **A47H** *23/08, 23/10;* **B32B** *3/02, 33/00*

U.S. Cl. 428—246 **10 Claims**

1. A window covering system providing improved insulating characteristics comprising an open weave drapery fabric, said decorative material having at least about a 5% open area, a flexible solar control film having at least one metallized surface layer, a flexible inner bonding stratum joining said drapery fabric and said solar control film to form a window covering, said solar control film having a visible light transmission level which permits the transmission of visible light through the open area of the open weave drapery fabric but substantially blocks the transmission of air therethrough, said window covering system being positioned on the interior side of a window to form a stagnant air barrier between said window and said window covering system so as to provide said improved insulating characteristics.

4,230,764

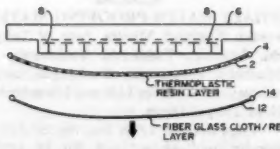
PRESTRESSED ARTICLE

Irving E. Figge, and Edward H. Dean, both of Newport News, Va., assignors to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Division of Ser. No. 906,186, May 15, 1978, Pat. No. 4,194,938. This application Apr. 30, 1979, Ser. No. 34,816

Int. Cl.[3] **B32B** *27/10;* **B65D** *5/56*

U.S. Cl. 428—268 **1 Claim**



1. A thermoformed article in the form of a three dimensionally curved surface embodying laminae of alternate epoxy resin layers fused to thermoplastic resin layers, each epoxy resin layer being an epoxy resin-impregnated high tensile strength fiberous weft, each thermoplastic resin layer being an acrylonitrile polymer, the epoxy resin layers being pretensiled by stresses developed during thermoforming.

4,230,765

NOVEL AMORPHOUS SILICA, AND PRODUCTS THEREOF

Akira Takahashi, and Toru Takikawa, both of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Continuation of Ser. No. 670,543, Mar. 25, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,204

Claims priority, application Japan, Mar. 25, 1975, 50-36298; Mar. 25, 1975, 50-36299; Mar. 25, 1975, 50-36300

Int. Cl.[3] **C01B** *33/12*

U.S. Cl. 428—283 **8 Claims**

1. A shaped body of amorphous silica consisting essentially of primary particles of amorphous silica having a surface area of 250 to 600 M^2/g and an oil adsorption of 300 to 900 $cc/_{100}g$ randomly three-dimensionally interlocked with one another integrally into the body in the absence of binders and voids interspersed therebetween, each of the primary particles containing at least 98% by weight of SiO_2 when dehydrated by ignition and chemically analyzed and having a crystalline appearance, at least two surfaces in symmetric relation, a length of about 1 to about 500μ and a thickness of about 50 Å to about 1μ, the length being at least about 10 times the thickness.

4,230,766

FIBER-BASE COMPOSITE MATERIAL HAVING HIGH TENSILE STRENGTH

Gilbert Gaussens, Meudon; Francis Lemaire, Chatillon, and Bach Van Nguyen, Bures-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 13, 1978, Ser. No. 942,032

Claims priority, application France, Sep. 16, 1977, 77 28001

Int. Cl.[3] **D04H** *1/58;* **B32B** *27/30, 27/38*

U.S. Cl. 428—288 **9 Claims**

1. A fiber-base composite material having high tensile strength, obtained by impregnating fibers with a composition containing at least one unsaturated epoxy resin having a double bond index within the range of 0.10 to 0.40, obtained by modifying a saturated epoxy resin by acrylic acid or methacrylic acid, at least a first ethylenically unsaturated monomer selected from the group consisting of vinyl-pyrrolidone, 2-vinyl-pyridine, 4-vinyl-pyridine, 2-vinyl-5-methyl-pyridine, methylamino-ethyl methacrylate, methoxy-ethyl acrylate, butoxy-ethyl acrylate, at least a second ethylenically unsaturated monomer selected from the group consisting of butyl acrylate, butyl methacrylate, isobutyl acrylate, isobutyl methacrylate, at least one ethylenically polyunsaturated monomer selected from the group consisting of hexane-diol diacrylate, diethyleneglycol diacrylate, tetraethyleneglycol, diacrylate, polyethylene-glycol diacrylate, pentaerythritol tetraacrylate, a photoinitiator and an organic peroxide, said composition comprising 30–60% by weight of said unsaturated epoxy resin, 5–30% by weight of said first monomer, 5–40% by weight of said second monomer, 5–25% by weight of said polyunsaturated monomer, 1–5% by weight of said photoinitiator and 1–5% by weight of said organic peroxide, by prepolymerizing said composition by means of ultraviolet rays in a first step, and then cross-linking said composition in a second step.

6. A method of fabrication of a fiber-base material having high tensile strength, wherein the fibers are impregnated with a composition containing at least one unsaturated epoxy resin having a double bond index within the range of 0.10 to 0.40, obtained by modifying a saturated epoxy resin by acrylic acid or methacrylic acid, at least a first ethylenically unsaturated monomer selected from the group consisting of vinyl-pyrrolidone, 2-vinyl-pyridine, 4-vinyl-pyridine, 2-vinyl-5-methyl-

pyridine, methylaminoethyl methacrylate, methoxy-ethyl acrylate, butoxy-ethyl acrylate, at least a second ethylenically unsaturated monomer selected from the group consisting of butyl acrylate, butyl methacrylate, isobutyl acrylate, isobutyl methacrylate, at least one ethylenically polyunsaturated monomer selected from the group consisting of hexane-diol diacrylate, diethylene-glycol diacrylate, tetraethylene-glycol diacrylate, polyethylene-glycol diacrylate, pentaerythritol tetraacrylate, a photoinitiator and an organic peroxide, said composition comprising 30–60% by weight of said unsaturated epoxy resin, 5–30% by weight of said first monomer, 5–40% by weight of said second monomer, 5–25% by weight of said polyunsaturated monomer, 1–5% by weight of said photoinitiator and 1–5% by weight of said organic peroxide, said composition is prepolymerized by means of ultraviolet rays in a first step and then cross-linked in a second step.

4,230,767

HEAT SEALABLE LAMINATED PROPYLENE POLYMER PACKAGING MATERIAL

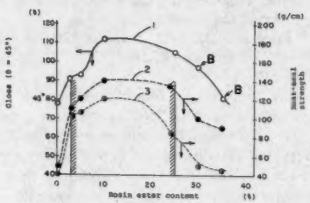
Tsutomu Isaka; Maki Matsuo, and Yukinobu Miyazaki, all of Inuyama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Feb. 8, 1979, Ser. No. 10,641

Claims priority, application Japan, Feb. 8, 1978, 53-13932; Dec. 29, 1978, 53-165137

Int. Cl.³ B32B *27/32, 31/16*

U.S. Cl. 428—349 **51 Claims**



1. A packaging material having excellent heat seal packaging properties, which comprises (A) a base layer consisting of a stretched film made of a polymer composition comprising (a-1) a propylene polymer and (B) a surface layer consisting of a stretched film made of a polymeric mixture comprising a polymer blend provided on at least one surface of said base layer, said polymer blend comprising (b-1) a copolymer of ethylene and propylene having an ethylene content of 10 to 0.5% by weight and a propylene content of 90 to 99.5% by weight and (b-2) a copolymer of butene and another polymerizable monomer having ethylenic unsaturation having a butene content of 70 to 99% by weight and the other polymerizable monomer content of 30 to 1% by weight, (b-1) and (b-2) being combined in a weight proportion of 5:95 to 95:5; the total thickness of (B) being 0.2 to 50% of the total thickness of (A) and (B).

28. A process for preparing a packaging material having excellent heat seal packaging properties, which comprises stretching an unstretched composite film in the machine direction and then stretching the stretched film in a direction substantially perpendicular to said machine direction, said unstretched composite film comprising (A) a base layer made of a polymer composition comprising (a-1) a propylene polymer and (B) a surface layer made of a polymeric mixture comprising a polymer blend provided on at least one surface of said base layer, said polymer blend comprising (b-1) a copolymer of ethylene and propylene having an ethylene content of 10 to 0.5% by weight and a propylene content of 90 to 99.5% by weight and (b-2) a copolymer of butene and an other polymerizable monomer having ethylenic unsaturation having a butene content of 70 to 99% by weight and the other polymerizable monomer content of 30 to 1% by weight, (b-1) and (b-2) being combined in a weight proportion of 5:95 to 95:5; the total thickness of (B) being 0.2 to 50% of the total thickness of (A) and (B).

4,230,768

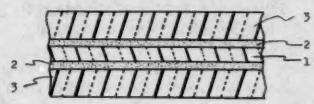
LAMINATED LIGHT-POLARIZING SHEET

Hiroyuki Hamada; Rinjiro Ichikawa, and Hajime Suzuki, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Mar. 29, 1979, Ser. No. 25,234

Int. Cl.² C09J *7/02;* **B32B** *27/32;* **G02B** *5/30*

U.S. Cl. 428—352 **13 Claims**



1. A laminated light-polarizing sheet comprising a light-polarizing film of a halogenated vinyl or vinylidene polymer containing polyene chains formed by partial dehydrohalogenation, said chains being oriented by stretching, and a film or sheet of an acrylate of methacrylate polymer laminated on at least one surface of the light-polarizing film.

5. A laminated light-polarizing sheet according to claim 1, wherein a pressure sensitive adhesive layer covered by a release film is further provided on at least one surface of the laminated light-polarizing sheet.

4,230,769

GLASS-POLYCARBONATE LAMINATE

John C. Goossens, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 29, 1979, Ser. No. 7,039

Int. Cl.² B32B *17/10, 27/08*

U.S. Cl. 428—412 **12 Claims**

1. A laminate of glass and polycarbonate resin comprising at least one polycarbonate resin lamina bonded to at least one glass lamina, the glass lamina which is bonded to the polycarbonate lamina being primed on the surface thereof adjacent to the polycarbonate lamina with two adhesion promoting primer layers consisting essentially of (i) a first primer layer disposed on said surface of said glass lamina and consisting essentially of the equilibrated reaction product of (a) water, (b) a $C_{(1-8)}$ alkanol, and (c) the reaction mixture of 1 to 3 moles of an aminoalkyl polyalkoxysilane per mole of diorganocarbonate, where there is employed in such equilibrated reaction product, on a volume basis, from 0.5 to 10 parts of (a), and from 0.5 to 100 parts of (c) per 100 parts of (b); and (ii) a second primer layer disposed on said first primer layer and consisting essentially of from about 1 to about 15 weight percent of an epoxy resin and from about 85 to about 99 weight percent of a polysiloxane-polycarbonate copolymer, said primed surface of said glass lamina being adhered to said polycarbonate resin lamina by means of an adhesive interlayer of a polysiloxane-polycarbonate copolymer.

10. A method for making a multi-ply composite which comprises heating to an elevated temperature an assembly comprising a glass ply, a polycarbonate resin ply, and a polysiloxane-polycarbonate copolymer adhesive interlayer disposed between said glass ply and said polycarbonate resin ply, while subjecting such assembly to a pressure of at least about one atmosphere, where the glass ply has been primed on the surface thereof adjacent said interlayer with two primer layers consisting essentially of (i) a first primer layer disposed on said glass consisting essentially of the equilibrated reaction product of (a) water, (b) a $C_{(1-8)}$ alkanol, and (c) the reaction mixture at temperatures in the range of between about 0° C. to about 90° C. of 1 to 3 moles of an aminolkyl polyalkoxysilane per mole of a diorganocarbonate, where there is employed in such equilibrated reaction product, on a volume basis, from 0.5 to 10 parts

of (a), and from 0.5 to 10 parts of (c) per 100 parts of (b); and (ii) a second primer layer disposed on said first primer layer consisting essentially of from about 1 to about 15 weight percent of an epoxy resin and from about 85 to about 99 weight percent of a polysiloxane-polycarbonate copolymer.

4,230,770

METAL PHOTOPOLYMER SUBSTRATES

Raymond B. Roennau, Stow; Daniel A. Chung, North Canton, and Shirish Jasani, Monroe Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 6, 1978, Ser. No. 949,314
Int. Cl.[2] B32B *27/40;* G03C *5/00*
U.S. Cl. 428—424.4 5 Claims

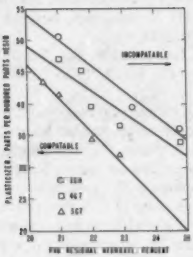
1. A printing plate composed of a conversion coated aluminum sheet adhered to a layer of photocured ordered polyetherurethane containing acrylates or methacrylate radicals with an adhesive composed of a set mixture of a polyvinyl chloride/vinyl acetate resin and an epoxy resin.

4,230,771

POLYVINYL BUTYRAL LAMINATES WITH TETRAETHYLENEGLYCOL DI-N-HEPTANOATE PLASTICIZER

Thomas R. Phillips, Beipre, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1979, Ser. No. 71,535
Int. Cl.[2] C08F *45/38;* B32B *17/10, 27/42*
U.S. Cl. 428—437 7 Claims



1. A laminar structure comprising at least one layer of glass and a layer of a plastic composition comprising polyvinyl butyral and, in compatible admixture therewith, a plasticizer comprising at least about 10 weight percent tetraethyleneglycol di-n-heptanoate of the formula:

$$CH_3(CH_2)_5C(=O)-O(CH_2CH_2O)_4C(=O)(CH_2)_5CH_3.$$

4,230,772

AMINE CROSSLINKED METHACROLEIN COPOLYMERS FOR COATINGS, BINDERS AND ADHESIVES

Graham Swift, Blue Bell; Benjamin Bartman, Norristown, and Harry J. Cenci, Warminster, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 2, 1979, Ser. No. 26,145
Int. Cl.[2] B32B *17/10;* B05D *3/02*
U.S. Cl. 428—442 15 Claims

1. A crosslinked vinyl addition polymer comprising methacrylaldimine crosslinking groups.

4,230,773

DECREASING THE POROSITY AND SURFACE ROUGHNESS OF CERAMIC SUBSTRATES

Peter Bakos, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,188
Int. Cl.[3] B05D *3/02, 5/12;* B32B *9/04;* C07F *7/02*
U.S. Cl. 428—447 32 Claims

1. A method for reducing the porosity and surface roughness of a ceramic substrate which comprises

applying a liquid coating composition containing at least one nonpolymeric silicon compound selected from the group of organosilanes, silicon halides, or mixtures thereof to at least one surface of said substrate;

drying the coated substrate; and

exposing the dried coated substrate to an elevated temperature higher than that employed in the drying of the coated substrate to thereby convert the nonpolymeric silicon compound to silicon oxides, and thereby obtaining a ceramic substrate having reduced porosity and surface roughness.

25. A ceramic substrate of reduced porosity and surface roughness obtained by the process of claim 1.

4,230,774

HEAT SEALABLE LAMINATE

William A. Watts, Uniontown, and Mark D. Creekmore, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 21, 1978, Ser. No. 879,824
Int. Cl.[2] B32B *27/30*
U.S. Cl. 428—518 1 Claim

1. A laminate comprising a film of a blend of 40 to 80 parts of polyvinyl chloride and 60 to 20 parts of a copolymer of about 60–70% by weight of butadiene and about 40–30% by weight of acrylonitrile adhered to a film of polypropylene with an adhesive layer of a copolymer of vinylidene chloride and a second monomer of vinyl chloride or acrylonitrile.

4,230,775

POLYVINYL BUTYRAL INK FORMULATION

Burton N. Derick, Mineralwells, W. Va.; Robert E. Moynihan, Lowell, Ohio, and Jon W. Wolfe, Matthews, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1977, Ser. No. 861,568
Int. Cl.[3] B32B *27/06*
U.S. Cl. 428—525 1 Claim

1. In a printing ink comprising unplasticized polyvinyl butyral, dye and solvent, the improvement which comprises unplasticized polyvinyl butyral having a hydroxyl content of about from 29 to 35 weight percent.

4,230,776

THERMOSENSITIVE RECORDING PAPER IMPROVED IN PRINTING QUALITY

Takao Kosaka, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 969,497
Claims priority, application Japan, Dec. 16, 1977, 52-151383
Int. Cl.[3] B32B *21/04*
U.S. Cl. 428—537 2 Claims

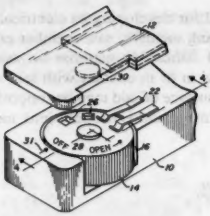
1. In a thermosensitive recording paper comprising a support and, supported thereon, a combination of a colorless or slightly colored lactone compound color former and phenolic compound capable of rendering said lactone compound to develop color, the improvement whereby the printing quality is improved, which improvement is characterized in that said support is a cast coated paper having a Bekk smoothness of 80 seconds or more.

4,230,777

BATTERY HOLDER WITH INTEGRAL ACCESS DOOR AND POWER SWITCH

Donald F. Gatto, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1979, Ser. No. 26,623
Int. Cl.³ H01M 2/10
U.S. Cl. 429—97 3 Claims



1. A battery cell housing arrangement for an electronic device having circuitry therein and comprising in combination:

a rotatable insulating element having a first recess therein, the first recess being dimensioned to receive a battery cell and having a first aperture in a side wall, the first aperture being dimensioned to admit the battery cell to the first recess, and having at least one second aperture in the upper surface thereof, positioned intermediate the center and the perimeter of the surface for exposing a portion of the battery cell case;

an insulating housing having a second recess with a third aperture therein, the second recess being dimensioned to fixedly retain the rotatable element for 360° rotation, with substantially less than one-half of the rotatable element projecting from the third aperture of housing element;

a first conductive member supported by the housing and coupled to circuitry therein and positioned to make continuous electrical contact with a first terminal of the battery cell; and

at least one second conductive member formed of a resilient material, supported by the housing and coupled to circuitry therein, positioned to contact and ride upon the upper surface of the rotatable element and, as the rotatable element is rotated to at least one first predetermined position, contacting a second cell terminal through one of the second apertures in the rotatable element, and, in a predetermined position, being insulated from the second cell terminal by the upper surface of the rotatable element;

and where no portion of the first aperture is aligned with the third aperture when the rotatable element is in one of the first and second positions.

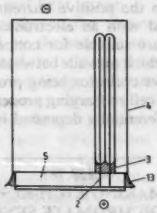
4,230,778

SODIUM-SULFUR BATTERY WITH GLASS ELECTROLYTE

Klaus von Benda, Ostfildern, and Holger Kistrup, Stuttgart, both of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellschaft mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 16, 1979, Ser. No. 21,208
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811687
Int. Cl.³ H01M 10/39
U.S. Cl. 429—104 21 Claims

1. A sodium-sulfur battery including positive and negative electrodes, in which sodium is the active mass of the negative electrode and sulfur or a sulfur-containing substance is the active mass of the positive electrode, said battery further including a glass electrolyte which is represented as a plurality of capillary tubes disposed substantially parallel to one another, and wherein the improvement comprises that the glass capillary tubes having outer diameters up to 1.0 mm contain the active mass of the positive electrode of the battery and are each completely sealed with fused glass of said capillary tubes and each of said capillary tubes contains a metallic wire for making electrical contact with said positive electrode mass, said wire extending substantially throughout the length of each capillary tube and passing through the wall thereof and having a diameter such that each wire occupies only a portion of the available volume in said capillary tube, the active mass of the negative electrode being located adjacent the exterior surfaces of said capillary tubes.



4,230,779

BATTERY PLATE

Brajendra P. Varma, Levittown, Pa., assignor to Eltra Corporation, Toledo, Ohio

Continuation of Ser. No. 904,436, May 9, 1978, abandoned. This application Aug. 7, 1979, Ser. No. 64,650
Int. Cl.³ H01M 6/04
U.S. Cl. 429—204 7 Claims

1. A positive plate for a lead acid battery, said plate consisting essentially of a lead or lead alloy grid, a composition containing lead dioxide, and from 0.1 to 0.4 percent based upon the weight of said plate, of at least one element selected from the group consisting of manganese and chromium, said element having been introduced by electrolysis into said plate from solution in an electrolyte.

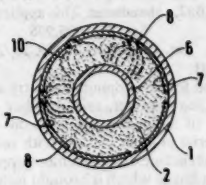
5. A lead acid storage battery including at least one negative plate, at least one positive plate, and an electrolyte, said positive plate consisting essentially of a lead or lead alloy grid, a composition containing lead dioxide, and from 0.1 to 0.4 percent, based upon the weight of said positive plate, of at least one element selected from the group consisting of manganese and chromium, said element having been introduced by electrolysis into said plates from solution in an electrolyte.

4,230,780

SODIUM-SULPHUR ELECTRIC CELL

Jean Jacquelin, Limours, France, assignor to Societe Anonyme dite: Compagnie Generale d'Electricite, Paris, France

Filed Oct. 22, 1979, Ser. No. 86,955
Claims priority, application France, Oct. 27, 1978, 78 30592
Int. Cl.³ H01M 10/39
U.S. Cl. 429—104 6 Claims



1. A sodium-sulphur type electric cell which includes:

a positive compartment which contains a positive active

material which is liquid at operating temperature, and a positive current collector;

a negative compartment which contains a negative active material which is liquid at operating temperature, and a negative current collector; and

a solid electrolyte tube which separates the two compartments; wherein the positive current collector is at least partially coated with an electronically insulating layer, means which are suitable for concentrating the lines of ionic current which prevails between said electrolyte tube and said positive collector being provided in such a way that during the cell recharging process, the positive active material is preferentially deposited in the vicinity of said means.

4,230,781

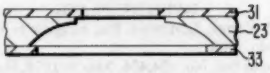
METHOD FOR MAKING ETCH-RESISTANT STENCIL WITH DICHROMATE-SENSITIZED ALKALI-CASEINATE COATING

Joseph J. Piascinski, Leola, and Ernest E. Doerschuk, III, East Petersburg, both of Pa., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 505,511, Sep. 12, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,269

Int. Cl.[2] G03C *5/00*

U.S. Cl. 430—5 **10 Claims**



1. A method for producing an etch-resistant stencil upon a surface comprising applying to said surface a coating of a liquid composition having a pH of about 5.8 to 7.0 and comprising

(i) an alkali caseinate,

(ii) an alkali dichromate photosensitizer for said caseinate

(iii) hydrated sodium borate, the weight of said hydrated sodium borate comprising 0.10 to 0.35 of the weight of said alkali caseinate, and

(iv) water,

drying said coating, photoexposing said coating to a light image, developing said exposed coating to produce said stencil, and then baking said stencil in air to render said pattern etch resistant.

4,230,782

MIGRATION IMAGING SYSTEM WITH MENISCUS DEVELOPMENT

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 300,940, Oct. 26, 1972, abandoned, which is a division of Ser. No. 84,691, Oct. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 837,780, Jun. 30, 1969, Pat. No. 3,975,195, and Ser. No. 483,675, Aug. 30, 1965, abandoned, said Ser. No. 837,780, is a continuation-in-part of Ser. No. 483,675, Aug. 30, 1965, and Ser. No. 725,676, May 1, 1968, abandoned, and Ser. No. 460,377, Jun. 1, 1965, Pat. No. 3,520,681, and Ser. No. 403,002, Oct. 12, 1964, abandoned, said Ser. No. 483,675, and Ser. No. 460,377, is a continuation-in-part of Ser. No. 403,002, , abandoned. This application May 15, 1978, Ser. No. 905,906

Int. Cl.[2] G03G *17/00, 13/22*

U.S. Cl. 430—41 **40 Claims**

1. In a method for developing an electrical latent image on a migration imaging member, said member comprising a substrate, a layer of softenable material on said substrate and migration material in or in contact with said softenable material, wherein the surface of said member opposite said substrate bears said latent image which is brought into and out of contact with a volume of liquid capable of developing said image by softening said softenable material sufficiently to cause migration of said migration material in depth in said softenable layer, the improvement comprising positioning a liquid support member adjacent said surface and in contact with said liquid volume which extends between said adjacent support member and said surface whereby a meniscus is formed on each liquid surface continuously between said surface and support, moving said imaging member past said support member and causing said liquid to flow in a direction away from the direction of said imaging member to provide turbulent flow of said liquid adjacent said surface whereby unmigrated migration material is removed from said imaging member and carried away in said flow.

23. In a method for developing an electrical latent image on a migration imaging member, said member comprising a substrate, a layer of softenable material on said substrate and migration material in or in contact with said softenable material, wherein the surface of said member opposite said substrate bears said latent image and is brought into and out of contact

with a volume of liquid capable of developing said image by softening said softenable material sufficiently to cause migration of said migration material in depth in said softenable layer, the improvement comprising moving said member past an adjacent liquid support member, said liquid support member being in contact with said liquid and forming a meniscus continuously between said surface and said support at least at the point of exit of said imaging member from said liquid and causing said liquid to flow in a direction away from the direction of said imaging member whereby (1) the surface tension forces of said liquid bridging said surface and said support member and (2) the relative movement of said imaging member to the liquid, cause removal of at least a portion of said development liquid which contains the unmigrated migration material from the imaging member as it passes said support member as said member is brought out of contact with said volume of liquid.

4,230,783

PROCESS AND APPARATUS FOR ELECTROPHOTOGRAPHY

Takao Aoki, Abiko; Hidejiro Kadowaki, Yokohama, and Naoki Iwami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1978, Ser. No. 914,729

Claims priority, application Japan, Jun. 17, 1977, 52-71901

Int. Cl.[2] G03G *13/01, 13/24*

U.S. Cl. 430—42 **11 Claims**

1. A process of electrophotography employing a photosensitive medium basically composed of an insulating top layer, an electrically conductive base layer, and a photoconductive layer therebetween, said process comprising the steps of:

applying a uniform corona discharge of a predetermined polarity to said photosensitive medium;

exposing said photosensitive medium to an original light image;

applying a secondary corona discharge having at least a component of the opposite polarity to that of said uniform corona discharge to said photosensitive medium simultaneously with or immediately after said exposing step;

uniformly exposing the photosensitive medium to near infrared range light during at least a part of said secondary corona discharging step; and

exposing the whole surface of said photosensitive medium to

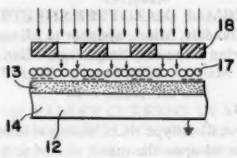
white light to form an electrostatic latent image corresponding to said original light image.

4,230,784

ELECTROSTATIC IMAGE FORMING PROCESS AND PARTICLES COMPRISING REACTIVE SUBLIMABLE DYE, SUBLIMING DEVELOPER AND CONDUCTIVE SUBSTANCE

Hisanori Nishiguchi, Neyagawa; Eisuke Ishida, Nara, and Yuji Takashima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 819,506, Feb. 26, 1977, abandoned. This application Sep. 13, 1978, Ser. No. 942,500
Claims priority, application Japan, Jul. 27, 1976, 51-89927
Int. Cl.[2] G03G *9/08*
U.S. Cl. 430—42 **19 Claims**



1. Image forming particles for use in an electrostatic image formation process which comprises the steps of:

(1) providing a photoconductive support member and said image forming particles;

(2) imparting to said photoconductive support an electrostatic charge, whereby said image forming particles are caused to adhere to the surface of said photoconduvtive support by electrostatic induction;

(3) exposing the charged photoconductive support member of (2) having said particles adhered thereto by electrostatic force, to a light image, the charge of the photoconductive support member at portions thereof being exposed to the light through the particles being attenuated, whereby the image of said particles is formed on said support by utilizing the difference in electrostatic attraction between the photoconductive support member and said image forming particles, said image on said support corresponding to said light image;

(4) heating the particles on the photoconductive support member obtained by the step (3) to cause a sublimable substance contained in said particles to be sublimed, whereby the colored image is obtained by causing said sublimable substance to adhere to said photoconductive support member or image receptor containing therein developing color agent which forms the colored image through reaction with said sublimable substance;

said particles comprising a sublimable substance selected from the group consisting of a colored subliming dye, a subliming colorless dye which is colorless in its normal state and develops color upon reaction with developing agent and a subliming developing agent which is colorless in its normal state and develops color upon reaction with a colorless dye and an electrically conductive substance which facilitates the electrostatic induction of said particles, and

said particles being capable of transmitting light and having a specific resistance of less than 10^{10} ohm cm.

19. An electrostatic image formation process which comprises the steps of:

(1) providing a photoconductive support member and image forming particles;

(2) imparting to said photoconductive support an electrostatic charge, whereby said image forming particles are caused to adhere to the surface of said photoconductive support by electrostatic induction;

(3) exposing the charged photoconductive support member of (2) having said particles adhered thereto by electrostatic force, to a light image, the charge of the photoconductive support member at portions thereof being exposed to the light through the particles being attenuated, whereby the image of said particles is formed on said support by utilizing the difference in electrostatic attraction between the photoconductive support member and said image forming particles, said image on said support corresponding to said light image;

(4) heating the particles on the photoconductive support member obtained by the step (3) to cause a sublimable substance contained in said particles to be sublimed, whereby the colored image is obtained by causing said sublimable substance to adhere to said photoconductive support member or image receptor containing therein developing color agent which forms the colored image through reaction with said sublimable substance;

said particles comprising a sublimable substance selected from the group consisting of a colored subliming dye, a subliming colorless dye which is colorless in its normal state and develops color upon reaction with developing agent and a subliming developing agent which is colorless in its normal state and develops color upon reaction with a colorless dye and an electrically conductive substance which facilitates the electrostatic induction of said particles, and

said particles being capable of transmitting light and having a specific resistance of less than 10^{10} ohms cm.

4,230,785

PRESSURE SENSITIVE ADHESIVE ELECROPHOTOGRAPHIC REPRODUCTION SHEETS

Lee A. Carlson, Southboro, and Richard G. Miekka, Sudbury, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 655,595, Feb. 5, 1976, abandoned, which is a continuation of Ser. No. 327,536, Jan. 29, 1973, abandoned, which is a continuation of Ser. No. 86,950, Nov. 4, 1970, abandoned. This application Feb. 27, 1978, Ser. No. 881,332
Int. Cl.[3] G03G *5/02*
U.S. Cl. 430—56 **9 Claims**

1. An electrographic member which can be used as a mailing label and the like, comprising

a conductive base member having oppositely positioned outer surfaces,

an electophotographic layer on one of said surfaces for the formation of an electrostatic image therein,

a non water-soluble pressure sensitive adhesive layer on the other of said surfaces, and

a release sheet temporarily overlying said adhesive layer,

the conductivity of said pressure sensitive adhesive layer being controlled by the addition of a water-soluble conductive material to permit the transport of charges through said adhesive layer in the formation of said electrostatic image without impairment of the adherence of said adhesive layer to said release sheet and to a receiving surface when said release sheet is removed.

4,230,786

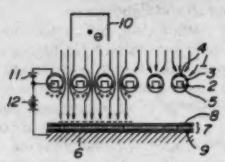
ELECTROGRAPHIC PROCESS OF IMAGING BY MODULATION OF IONS

Masaji Nishikawa; Toshio Nakatsubo, both of Hachioji; Hiroshi Tsuda, Mitaka; Shigo Fujie, Shizuoka; Masazi Kanamaru, Shizuoka, and Shosaku Koseki, Shizouka, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,659
Claims priority, application Japan, Sep. 12, 1977, 52-108910
Int. Cl.[2] G03G *15/00*
U.S. Cl. 430—53 **6 Claims**

1. An electrographic process of producing, on a dielectric coated record medium, an electrostatic copy latent image by modulating a flow of corona ions with the aid of an electrostatic latent image which has been produced on a photoconductive photosensitive screen, characterized by making a ratio

K of a maximum surface potential V volts of the electrostatic copy latent image produced on said dielectric coated record medium to an intensity of the electric field E volts/mm established between said photoconductive photosensitive screen and said dielectric coated record medium, i.e. K=V/E smaller



than about 0.18 for the purpose of preventing enlargement of dots of the copy picture image, said intensity of the electric field E established between said photoconductive photosensitive screen and said dielectric coated record medium being about 500 to 1,000 volts/mm.

4,230,787

MAGNETIC TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES AND A PROCESS FOR THE PREPARATION THEREOF

Shotaro Watanabe, Machida; Katsutoshi Tozawa, Kokubunji, and Shigeru Uetake, Sayama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi, Japan

Filed Aug. 8, 1977, Ser. No. 822,786

Claims priority, application Japan, Aug. 10, 1976, 51/95197

Int. Cl.[2] G03G *9/08, 9/14*

U.S. Cl. 430—107 **8 Claims**

1. In a one component developer for developing a latent electrostatic image, a magnetic toner containing magnetic particles and binder resins as main components, the improvement comprising said magnetic particles being substantially coated with electric charge-controlling dyestuffs before being combined with said binder resins, the content of said magnetic particles being 30 to 70% by weight, the content of said electric charge-controlling dyestuffs being 0.02 to 5% by weight and the specific resistance of said magnetic toner being at least $10^{13}\Omega$cm.

4,230,788

METHOD OF MANUFACTURING AN EXTERNAL ELECTRICALLY CONDUCTING METAL PATTERN

Elisabeth J. Spiertz; Christiaan F. W. Flinsenberg, and Leendert K. H. van Beek, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 720,809, Sep. 7, 1976, abandoned, which is a continuation of Ser. No. 525,154, Nov. 19, 1974, abandoned. This application Oct. 11, 1978, Ser. No. 950,508

Claims priority, application Netherlands, Nov. 26, 1973, 7316102

Int. Cl.[2] G03C *1/58, 5/24*

U.S. Cl. 430—153 **3 Claims**

1. In the method of manufacturing an external electrically conducting metal pattern on a hydrophobic support which is at least superficially non-conducting, which method comprises subjecting to actinic radiation desired areas of a photosensitive coating adhering to said support and containing uniformly dispersed in an organic binder selected from the group consisting of polyesters and epoxy resins a photosensitive material selected from the group consisting of diazosulfides and diazosulfonates, and capable, upon exposure to acinic light, of producing a light reaction product which in the presence of water is capable of forming free silver and mercury metal from water-soluble silver and mercurous compounds to thereby form light reaction products at exposed areas of said coating, exposing said coating to treatment with at least one water-soluble salt selected from the group consisting of a water-soluble mercury salt and a water soluble silver salt in the presence of water to thereby form a latent metal image and then physically developing said latent metal image by treatment with an aqueous solution of a metal salt and a reducing agent for said metal salt, the improvement wherein at least in the step wherein the coating is exposed to treatment with at least one water-soluble salt in the presence of water to form a latent image in place of water there is employed a mixture of water and at least one water-soluble liquid organic solvent for said photosensitive material selected from the group consisting of chloroform, toluene, ethylacetate, liquid alcohols and liquid ketones in a ratio by volume of the total amount of organic solvent to water of 1:10 to 2:1 and wherein said mixture is capable of swelling said binder.

4,230,789

THERMAL DIAZOTYPE SHEETS

Herbert J. Fish, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 13, 1978, Ser. No. 885,877

Int. Cl.[2] G03C *1/60*

U.S. Cl. 430—159 **5 Claims**

1. A heat reactive diazotype sheet having at least two layers, with one layer coated upon the other, one of said layers comprising a heat-softenable binder material and an acid-stabilized light sensitive diazonium salt capable of reacting with an azo-coupler compound to form a dye, and the other of said layers comprising a heat-softenable binder material and an acid-neutralizer component capable of providing basic equivalents in an amount at least sufficient to neutralize said acid stabilization of said diazonium salt so as to provide a weakly basic environment for the diazonium salt in the sheet and to render said acid-stabilized diazonium salt reactive with said azo-coupler compound, and at least one of said layers containing an azo-coupler, said diazotype sheet being characterized by said acid-neutralizer component being comprised of at least 25% by weight imidazoline acid-neutralizer compound selected from the group consisting of 2-phenyl-2-imidazoline, 1,5-tetramethylene-2-o-tolylimidazoline, 2-benzyl-2-imidazoline, trifuryl-2-imidazoline, and 1,2-diphenyl-4,4-dimethyl-2-imidazoline.

4,230,790

PHOTOPOLYMERIZABLE COMPOSITIONS USEFUL IN DRY FILM PHOTORESIST

Martin J. Hill, Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 802,485, Jun. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 593,106, Jul. 3, 1975, abandoned. This application Jan. 31, 1979, Ser. No. 8,048

Int. Cl.[2] G03C *1/68*

U.S. Cl. 430—288 **6 Claims**

1. In a photopolymerizable composition consisting essentially of:

(a) a photoinitiator;

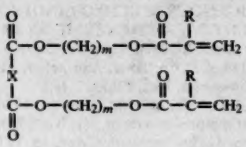
(b) a macromolecular linear organic film-forming polymeric binder; and

(c) a photopolymerizable monomer, the improvement comprising in combination:

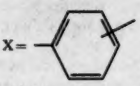
(i) 0.001 to 20 parts by weight, based on the weight of monomer, of non-peroxide photoinitiator, which is activatable by actinic radiation and thermally inactive at and below 85° C.;

(ii) 10 to 95 parts by weight, based on the total weight of the photopolymerizable composition, of binder; and

(iii) 5 to 90 parts by weight, based on the total weight of the photopolymerizable composition of an ethylenically unsaturated addition-polymerizable compound having a molecular weight of at least 150 and a boiling point of above 100° C. and having the formula:



where R=H, CH_3;



or $(CH_2)_{n-2}$; and m and n are independently from 2 to 10.

4,230,791

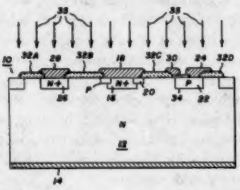
CONTROL OF VALLEY CURRENT IN A UNIJUNCTION TRANSISTOR BY ELECTRON IRRADIATION

Hing C. Chu, and Y. S. Edmund Sun, both of Liverpool, N.Y., assignors to General Electric Company, Auburn, N.Y.

Division of Ser. No. 828,028, Aug. 26, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,871

Int. Cl.³ H01L *7/00*

U.S. Cl. 430—296 **10 Claims**



1. A method for changing the valley current of a unijunction transistor of the type including an emitter-base junction comprising:

exposing at least said emitter-base junction of said unijunction transistor to lattice defect causing radiation for a time sufficient to change said valley current of said unijunction transistor.

4,230,792

LITHOGRAPHIC PRINTING PLATE FROM SILVER HALIDE EMULSION

Yasuo Tsubai; Akio Yoshida, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

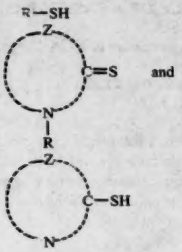
Continuation of Ser. No. 812,893, Jul. 5, 1977, abandoned. This application Jan. 4, 1979, Ser. No. 811

Claims priority, application Japan, Jul. 15, 1976, 51-84164

Int. Cl.² G03F *7/02*

U.S. Cl. 430—302 **20 Claims**

1. In a method for making a lithographic printing plate, which comprises exposing a photosensitive material including a silver halide emulsion layer, and developing the exposed material, the improvement comprising making an undeveloped silver halide portion of said silver halide emulsion layer receptive to oleophilic inks by treating the developed material either (1) simultaneously with at least one solvent for silver halides and at least one organic mercapto or thion compound selected from the group consisting of compounds having the formulae (I), (II) and (III):



(I)
(II)
(III)

wherein R is alkyl having at least 10 carbon atoms, aryl or aralkyl group R' is hydrogen, an alkyl having not more than 12 carbon atoms, aryl or aralkyl group, and Z is an atomic group required to form a 5- or 6-membered heterocyclic compound together with N and C in the formulae, or (2) successively, first with said solvent and second with said organic mercapto or thion compound, said organic mercapto or thion compound being capable of forming a compound which is more stable and has a lower solubility than a soluble silver complex formed by said solvent to make an undeveloped silver halide portion receptive to oleophilic inks.

4,230,793

PROCESS FOR THE PRODUCTION OF SOLDER MASKS FOR PRINTED CIRCUITS

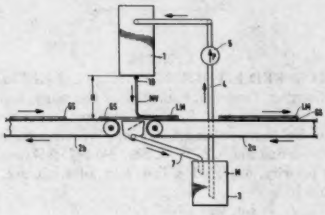
Ewald Losert, Rheinfelden, and Heinz Rembold, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,971

Claims priority, application Switzerland, Nov. 21, 1977, 14182/77

Int. Cl.² G03C *5/00*

U.S. Cl. 430—315 **3 Claims**



1. A process for producing solder masks on printed circuits having at least one aperture therethrough by applying a thin layer of a liquid substance curable by irradiation to a printed circuit, irradiating the layer except in the those areas of the circuit to be soldered, and developing the layer with an agent which disolves the unirradiated zones: wherein the improvement comprises, applying said layer to said circuit by conveying the circuit beneath a free falling curtain of said liquid substance whose viscosity is selected from the range 500 to 1200 mPa's at impingement on said circuit, adjusting the height of said curtain above said circuit to produce a rate of flow at impingement selected from the range 60 to 100 m/min, and adjusting the rate at which said circuit is conveyed beneath said curtain to be greater than a rate slightly less than the rate at which said curtain falls on said circuit.

4,230,794

IMPROVING ETCH RESISTANCE OF A CASEIN-BASED PHOTORESIST

Donald C. McCarthy, Delran, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1979, Ser. No. 21,325
Int. Cl.[3] G03C 5/00
U.S. Cl. 430—323 15 Claims

1. A method of improving the etch resistance of a casein-based photoresist pattern to a low specific gravity ferric chloride based etchant solution comprising, treating a dried casein-based photoresist pattern with a formaldehyde solution, and thereafter drying the treated photoresist pattern.

4,230,795

MULTIPART PHOTOSENSITIVE ELEMENT WITH BOTH FIXED CONTRAST AND VARIABLE CONTRAST PART RECORDS

Donald Krause, 8 Clintwood Dr., Apt. #8A, Brighton, N.Y. 14620

Continuation-in-part of Ser. No. 847,583, Nov. 1, 1977, Pat. No. 4,175,967. This application Apr. 26, 1979, Ser. No. 33,378
Int. Cl.[3] G03C 1/76, 3/00
U.S. Cl. 430—503 11 Claims

1. A multipart photosensitive element comprising: a support, a plurality of partial record portions carried on said support; all of said partial record portions together forming a full record; each of said partial record portions having a preselected density range of said full record and all of said partial record portion densities combined forming the total density range of said full record; at least one of said partial record portions including a fixed contrast emulsion and at least one of said partial record portions including a variable contrast emulsion for varying the contrast of that partial record portion over its preselected density range; each of said variable contrast emulsions being photoresponsive in a different spectral region from the other variable contrast emulsions in the other partial record portions for independently selectively varying the contrast in each of the partial record portions including variable contrast emulsions.

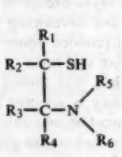
4,230,796

HIGH SPEED LITHOGRAPHIC FILM ELEMENT

Herbert Gunther, Dreieich, Fed. Rep. of Germany, and Herbert Blank, Darmstadt, Fed. Rep. of Germany, assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1978, Ser. No. 945,061
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2802016
Int. Cl.[3] G03C 1/06, 1/28
U.S. Cl. 430—523 8 Claims

1. A lithographic film element comprising a film support having one or more light-sensitive gelatino-silver halide emulsion layers coated thereon, each of which contains a development accelerator of the general formula:



or a salt thereof, wherein each of R_1; and R_2 =H or C_1–C_5 alkyl, each of R_3 and R_4=H or —COOR, where R, R_5, and R_6=C_1–C_5 alkyl.

4,230,797

HETEROGENOUS SPECIFIC BINDING ASSAY EMPLOYING A COENZYME AS LABEL

Robert C. Boguslaski, Elkhart; Robert J. Carrico, Bremen, both of Ind., and James E. Christner, Ann Arbor, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 667,982, Mar. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 572,008, Apr. 28, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,838
Int. Cl.[2] C12Q 1/66
U.S. Cl. 435—7 26 Claims

1. In a heterogeneous specific binding assay method for determining a ligand in a liquid medium, which method comprises the steps of:

(a) contacting said liquid medium with reagent means including a labeled conjugate comprising a specific binding substance coupled to a labeling substance, said reagent system producing

(1) a bound-phase of the labeled conjugate in which the specific binding substance therein is bound by a specific binding partner thereto and

(2) a free-phase of the labeled conjugate in which the specific binding substance therein is not bound by a specific binding partner thereto,

(b) separating said bound-phase and said free-phase; and

(c) determining said labeling substance in said bound-phase or said free-phase as a function of the amount of said ligand in said liquid medium;

the improvement wherein said labeling substance in said labeled conjugate is a nucleotide coenzyme, and wherein said labeling substance measuring the extent to which said coenzyme participates in an enzymatic reaction involving an enzyme which requires said coenzyme for activity.

11. In a reagent means for use in determining a ligand in a liquid medium, which means comprises (i) a labeled conjugate comprising said ligand or a specific binding analog thereof coupled to a labeling substance, and (ii) a specific binding partner of said ligand which binding partner is in a form which is insoluble in said liquid medium,

the improvement wherein said labeling substance in said labeled conjugate is a nucleotide coenzyme.

4,230,798

UNITIZED URIC ACID TEST COMPOSITION AND DEVICE

Eppie S. Chang, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 13, 1978, Ser. No. 877,500
Int. Cl.[2] G01N 31/14
U.S. Cl. 435—10 16 Claims

1. In test means for the detection of uric acid comprising a uricase-active substance, at least one chromogen, and peroxidase, the improvement wherein the uricase-active substance is animal-originated uricase which has been dialyzed against a low metal binding constant buffer, has a pH of from about 6.8 to about 7.5, is stable in said pH range and, is free of pH sensitive contaminants having a molecular weight of less than about 6,000.

4,230,799

PROCESS FOR THE PREPARATION OF ANTIBIOTIC W-10 COMPLEX AND FOR THE ISOLATION OF ANTIBIOTIC 20561 AND ANTIBIOTIC 20562 THEREFROM

David Taplin, Miami, Fla.; Marvin J. Weinstein, East Brunswick, N.J.; Raymond T. Testa, Verona, N.J.; Joseph A. Marquez, Montclair, N.J., and Mahesh G. Patel, Verona, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 767,102, Feb. 9, 1977, Pat. No. 4,137,224.
This application Oct. 19, 1978, Ser. No. 953,050
Int. Cl.[3] C12P *19/62;* C12R *1/01*
U.S. Cl. 435—76 4 Claims

1. A process for preparing Antibiotic W-10 Complex which comprises cultivating under controlled aerobic conditions in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen an Antibiotic W-10 Complex producing member of Aeromonas sp. W-10 until a composition of matter having substantial antifungal activity is produced and recovering the Antibiotic W-10 Complex from said medium.

4,230,800

PROCESS FOR PRODUCING A POLYSACCHARIDE USING *PSEUDOMONAS POLYSACCHAROGENES* M-30

Toshihiro Takayama; Fujio Endo; Tsuneo Nozawa; Yoshiro Masuda; Motokuni Mori, and Toshiji Kanayama, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited and Mitsubishi Yuka Pharmaceutical Co., Ltd., both of Tokyo, Japan

Filed Jun. 29, 1978, Ser. No. 920,142
Claims priority, application Japan, Nov. 8, 1977, 52/133104
Int. Cl.[3] C12P *19/04;* C12R *1/38*
U.S. Cl. 435—101 2 Claims

1. A process for the production of a polysaccharide which comprises cultivating a microorganism having the identifying characteristics of *Pseudomonas polysaccharogenes* M-30 in a medium containing methanol as a sole or major carbon source and isolating a polysaccharide from a cultured broth.

4,230,801

PRODUCTION OF α-EMULSANS

David L. Gutnick, Ramat Aviv, and Eugene Rosenberg, Raanana, both of Israel, assignors to Biotechnologie Aktiengesellschaft für Emulsan, Basel, Switzerland

Filed Feb. 22, 1979, Ser. No. 12,974
Int. Cl.[2] C12P *19/04*
U.S. Cl. 435—101 23 Claims

1. A process for producing extracellular microbial lipopolysaccharides which comprises (A) inoculating an aqueous fermentation medium containing a growth-sustaining amount of one or more fatty acid salts with a culture of Acinetobacter Sp. ATCC 31012 or its mutants; (B) aerobically growing the microorganism in such fermentation medium, while adding additional amounts of such fatty acid salt or salts to sustain growth, for a period of time sufficient to produce extracellular microbial protein-associated lipopolysaccharides (herein collectively called "α-emulsions") in which the lipopolysaccharide components (herein collectively called "apo-α-emulsans") of such α-emulsans are N- and O-lipoacylated heteropolysaccharides made up of major amounts of D-galactosamine and an aminouronic acid, such apo-α-emulsans containing at least 5 percent or above by weight of fatty acid esters in which (1) the fatty acids contain from about 10 to about 18 carbon atoms; and (2) about 50 percent by weight or more of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid; and (C) separating substantially all of the microbial cell mass from the emulsan-containing culture medium.

4,230,802

UNREFINED GLUCOSE SYRUP AS SUBSTRATE BY GLUCOSE ISOMERIZING ENZYME IN PRODUCING FRUCTOSE FROM GLUCOSE

Irving Ehrenthal, University City, Mo.; Louis F. Slapshak, Belleville, Ill., and Jagdish Rajpara, St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Jan. 5, 1976, Ser. No. 646,629
Int. Cl.[3] C12P *19/24*
U.S. Cl. 435—94 7 Claims

1. A process for converting glucose to fructose comprising the steps of:

A. adding to a refined high glucose substrate, a glucose isomerizing enzyme and at least about 0.1% by weight based on the weight of dry solids of the component of starch conversion mud which comprises fatty acids, esterified fatty acids, coagulated proteins, and hemi-cellulose, said refined substrate containing more than about 90% glucose and being free from extraneously added cobalt salt,

B. continuing the conversion without adding any extraneous cobalt salt, and

C. recovering a glucose-fructose syrup which is free from extraneously added cobalt salt and which contains at least 30% fructose.

4,230,803

PREPARATION OF WATER-INSOLUBLE ENZYME COMPOSITIONS

Guenter Weidenbach, Hanover, and Dirk Bonse, Arpke, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,227
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726188
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—176 27 Claims

1. A process for preparing a water-insoluble enzyme composition wherein an enzyme is covalently bonded to an inorganic support material whereby a maximum activity of the insoluble enzyme composition is achieved with the lowest possible amount of enzyme, said process comprising the steps of:

(a) selecting an inorganic support material having the most frequent pore-diameter which produces an enzyme composition having the highest absolute activity when a plurality of inorganic support materials having different most frequent pore-diameters are each individually contacted with an enzyme solution containing a given concentration of enzyme, said most frequent pore-diameter producing the highest absolute activity being independent of the enzyme concentration in the solution;

(b) selecting an aqueous enzyme solution containing the concentration of enzyme which produces a composition that has a relative activity of substantially 100% when the support material of step (a) is contacted with a plurality of enzyme solutions having different concentrations of enzyme;

(c) contacting the support material of step (a) with the enzyme solution of step (b) whereby a portion of the enzyme from the solution is taken up by the support material to produce a water-insoluble enzyme composition; and

(d) separating the resulting water-insoluble enzyme composition from the remaining solution.

4,230,804

WATER-INSOLUBLE PENICILLIN ACYLASE PREPARATION

Thomas A. Savidge, Stayning, and Lawson W. Powell, Worthing, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 832,343, Sep. 12, 1977, abandoned, which is a continuation of Ser. No. 709,009, Jul. 26, 1976, abandoned, which is a division of Ser. No. 532,051, Dec. 12, 1974, Pat. No. 4,001,264. This application Oct. 27, 1978, Ser. No. 955,224

Claims priority, application United Kingdom, Dec. 28, 1973, 59978/73

Int. Cl.[2] C07G *7/02*

U.S. Cl. 435—180 6 Claims

1. A re-usable water-insoluble penicillin acylase complex wherein penicillin acylase is adsorbed on a methacrylic acid-divinyl benzene macroporous copolymer cationic exchange resin having a substantial proportion of carboxylic acid groups in free acid or anionic form and the adsorbed penicillin acylase is cross linked with a water-soluble aldehyde selected from the group consisting of glutaraldehyde, glyoxal and formaldehyde.

4,230,805

THEOPHYLLINE ANTIGENS AND ANTIBODIES

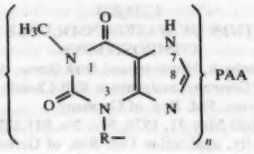
Prithipal Singh, Santa Clara, and Mae W. Hu, Sunnyvale, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation of Ser. No. 787,829, Apr. 15, 1977, Pat. No. 4,156,081. This application Jan. 11, 1979, Ser. No. 2,527

Int. Cl.[2] C07G *7/00, 7/02*

U.S. Cl. 435—188 18 Claims

1. A compound of the formula



wherein:

PAA is a poly(amino acid) of at least about 5,000 molecular weight;

n is at least 1 and up to the molecular weight of PAA divided by 1,500; and

R is a linking group of from 1 to 12 atoms other than hydrogen which are carbon, oxygen, nitrogen and sulfur.

4,230,806

PROCESS FOR THE PRODUCTION OF MICROBIAL PROTEIN AND LIPID FROM VEGETABLE CARBOHYDRATES BY CULTURE OF MICROBES

Michihiko Nojiri, Takaishi; Kazuo Kakutani, Nishinomiya; Shigezo Uedono, Kigawahigashi; Kazuo Uenakai, Sakai, and Masafumi Matsumoto, Shibatani, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,442

Int. Cl.[3] C10N *1/16*

U.S. Cl. 435—255 11 Claims

1. A process for the production of protein and lipid from carbohydrates by culture of a yeast selected from the group consisting of the Candida strain and the Rhodotorula strain, comprising a first enzymatic step of liquefying the carbohydrate with a dextrinogenic enzyme to prepare a culture medium for the yeast, thereafter sterilizing said culture medium, thereafter a second enzymatic step of effecting simultaneous enzymatic saccharification and culture of said yeast by aseptically adding a saccharogenic amylase to said culture medium while culturing said yeast therein, and thereafter separating the cultured yeast cells and lipid from said culture medium.

11. A continuous multi-stage culture method for producing microbial protein, comprising:

liquefying a carbohydrate to form a culture medium;

thereafter sterilizing said culture medium to produce a sterilized culture medium;

providing at least three culture tanks connected in series;

continuously introducing said sterilized culture medium, an amylase and a yeast culture into the first of said culture tanks to form a cultivation liquid;

continuously conducting the cultivation liquid from said first tank serially through the remainder of said culture tanks;

maintaining conditions suitable for yeast growth and saccharification of the carbohydrate in said first tank;

maintaining conditions suitable for logarithmic growth of said yeast in said second tank;

maintaining conditions suitable for stationary growth of said yeast in said third tank;

returning a portion of said cultivation liquid from said second tank to said first tank thereby maintaining the yeast concentration in the first tank at a desired level;

maintaining pressure of 1,000–2,500 mm. Aq. in the first of said tanks, 600–1,800 mm. Aq. in the second of said tanks, and 300–1,500 mm. Aq. in the third of said tanks to control the flow rates of the culture medium from tank to tank and the level of the culture medium in each tank within the desired range and to promote a spontaneous flow from tank to tank; and

recovering microbial protein from the third tank.

4,230,807

METHOD FOR REGENERATING A WEAK BASE ANION EXCHANGER

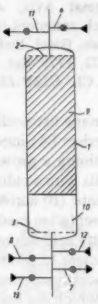
Sheldon Evans, Overveen, Netherlands, assignor to Hoogovens Ijmuiden, B.V., IJmuiden, Netherlands

Filed Jul. 9, 1976, Ser. No. 703,814

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530677

Int. Cl.[2] B01D *15/06*

U.S. Cl. 521—26 8 Claims



1. A method for regenerating a weak base anion exchanger which comprises passing a regenerating chemical in an upward direction through a granular resinous mass of such exchanger, thereupon displacing said chemical and rinsing the mass with water, said regenerating chemical being a lime slurry having a concentration of 1 to 5% by weight, which is both supplied to and withdrawn from the granular mass in an evenly distributed flow with a flow rate of at least 10 m^3, per hour, per m^3 resin material ($m^3/h/m^3$), while said granular mass is in a compacted state.

4,230,808

METHOD FOR MAKING SOLID MATERIALS HAVING A FLASH POINT OF LESS THAN 500° C. FIRE ALARMING, FIRE ALARMING AND SELF EXTINGUISHING, OR FIRE ALARMING, SELF-EXTINGUISHING AND FIRE ABATING

Anthonius H. Pietersen, Thoiry Feniere, St. Genis Pouilly, France

Filed Nov. 29, 1978, Ser. No. 964,693

Claims priority, application Netherlands, Dec. 1, 1977, 7713309; Sep. 12, 1978, 7809289

Int. Cl.³ C08G *8/00*

U.S. Cl. 428—307 **22 Claims**

1. In a method of making solid materials having a flash point of less than 500° C. fire alarming, or fire alarming and self extinguishing, or fire alarming, self extinguishing and fire abating, the improvement comprising applying to said solid material at least one surface layer containing micro capsules of a bromofluoroalkane, the micro capsules having an external diameter of from 200 to 260 micrometers, and further having walls consisting of a polymer having pores therein, the pores having been sealed by means of a hydrophobic polycondensation product of an aromatic polyhydroxy compound and an aldehyde, and the bromofluoroalkane within the micro capsules being liquid at ambient temperature and having a critical temperature of at least 100° C.

4,230,809

PRESSURE-RESISTANT POLYURETHANE-POLYUREA PARTICLES FOR THE ENCAPSULATION OF ACTIVE INGREDIENTS AND PROCESS FOR THEIR MANUFACTURE

Rudolf Heinrich, Kelkheim; Heinz Frensch, Frankfurt am Main, and Konrad Albrecht, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

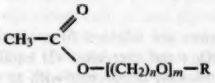
Filed Dec. 19, 1978, Ser. No. 971,099

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2757017

Int. Cl.² C08G *18/14, 18/08*

U.S. Cl. 521—65 **14 Claims**

1. A process for the manufacture of pressure-resistance internally textured polyurethane-polyurea particles which comprises forming an organic solvent solution of isocyanate prepolymer which is a reaction product of a stoichiometric excess of an aliphatic, aromatic, cycloaliphatic or araliphatic di- or polyisocyanate with a diol or polyol, said reaction product having a mean molecular weight of from about 300 to 10,000, said organic solvent solution also containing from 2 to 85% by weight an alkyl and/or alkoxyalkyl acetate of the formula



in which

m is 0 to 2

n is 1 to 4 and

R is (C_1-C_5)alkyl

and dispersing said solvent solution as an organic phase at a temperature of 0° to 95° C. in an aqueous phase comprising water, a protective colloid and optionally a surface-active agent to form droplets of said organic phase wherein said isocyanate prepolymer reacts with the water of said aqueous phase to form said polyurethane-polyurea particles.

4,230,810

METHOD OF PREPARING RESIN

Richard R. Lattime, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 7, 1979, Ser. No. 36,957

Int. Cl.³ C08F *2/00, 20/04, 220/06, 2/16*

U.S. Cl. 526—224 **7 Claims**

1. A method of preparing a resin composition and having a softening point in the range of about 100° C. to about 300° C., which comprises free radical polymerizing, in an aqueous medium having a pH in the range of about 2 to about 7 and in the presence of a free radical initiator and organic mercaptan chain transfer agent, a monomer mixture, based on 100 weight percent of monomers, in a dispersion by mixing with or in water (A) about 0.25 to about 2 weight percent of at least one water soluble, polymerizable surfactant in the form of a bifunctional monomer in acid form or neutralized salt thereof, said monomer composed of (i) a first, hydrophilic functional component selected from at least one reactive acid radical or neutralized metal salt thereof selected from at least one of sulfate, sulfonate, carboxylate or phosphate radicals where said metal salts thereof are selected from at least one of sodium, potassium, ammonium or organic amine salts and (ii) a second hydrophobic functional component comprised of at least one of (a) alkenyl aromatic radical selected from at least one of styrene, α-methylstyrene and vinyl toluene or (b) selected from at least one of ethylene, propylene, butene, pentene, hexene, heptene, octene, nonene, decene, undecene, dodecene, tridecene, tetradecene, pentadecene and hexadecene of (c) an n-alkylol amide of an alpha-beta-olefinically unsaturated carboxylic acid having 4–10 carbon atoms, (B) about 60 to about 95 weight percent of at least one hard segment hydrophobic enhancing monomer selected from styrene, α-methylstyrene, acrylonitrile, methacrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride, (C) about 0 to about 35 weight percent of at least one soft segment hydrophobic enhancing monomer selected from at least one acrylate selected from methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, lauryl acrylate, or at least one vinyl ether selected from methyl, ethyl, butyl, octyl, decyl, dodecyl and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said dienes of monomer part (C) and said monomer part (B) vinyl chloride and vinylidene chloride are not mixed together and copolymerized, and (D) about 0.25 to 5.0 weight percent of at least one hydrophilic enhancing organic acid selected from acrylic, methacrylic, fumaric, itaconic and maleic acid; and where in said aqueous polymerization medium, if additional emulsifier(s) is used, it is used in an amount up to a maximum of about 5 weight percent of said bifunctional monomer surfactant used.

4,230,811

COPOLYMERS OF ETHYLENE AND ETHYLENICALLY UNSATURATED MONOMERS, PROCESS FOR THEIR PREPARATION AND DISTILLATE OIL CONTAINING SAID COPOLYMERS

Stephen Ilnyckyj, Maplewood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 461,621, Apr. 17, 1974, abandoned. This application Oct. 2, 1978, Ser. No. 947,813

The portion of the term of this patent subsequent to May 11, 1995, has been disclaimed.

Int. Cl.² C08F *210/02, 218/08*

U.S. Cl. 526—227 **3 Claims**

1. In a method of preparing an oil-soluble copolymer of ethylene and vinyl acetate useful as a middle distillate fuel oil flow improver for depressing the pour point of said oil and limiting the size of wax crystals that form on cooling said oil below its cloud point, by free radical initiation, wherein said copolymer has a number average molecular weight by Vapor Phase Osmometry in the range of 1,000 to 5,000 and consists essentially of about 3 to 20 molar proportions of ethylene per

molar proportion of vinyl acetate, which method comprises copolymerizing said monomers in a liquid phase reaction in about 100 to 600 parts by weight of C_5 to C_{10} hydrocarbon solvent based upon 100 parts by weight of copolymer to be produced, at a temperature of about 200° to 270° F. under an ethylene pressure of about 700 to 3,000 psig sufficient to maintain a liquid phase medium and to maintain the desired concentration of ethylene in solution in the solvent, the improvement which comprises using about 0.1 to 5 parts by weight of t-butyl peroctanoate as initiator per 100 parts by weight of copolymer to be produced.

4,230,812

PIGMENT PREPARATIONS

Leo Tork; Günter Kolb, both of Leverkusen, and Wolfgang Höhne, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,582

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801817

Int. Cl.[2] **C09B** *67/00;* **D06N** *3/08;* **D06P** *3/32*

U.S. Cl. 526—320 **8 Claims**

1. Pigment preparations containing 2–70% by weight, relative to the total preparation, of an inorganic or organic pigment dispersed in a solution of 10 to 49% by weight, relative to the total preparation, of a water-insoluble copolymer in an organic solvent, said copolymer is a copolymer of 40–60% by weight of acrylic acid ethyl ester, 30–50% by weight of methacrylic acid methyl ester and 5–15% by weight of acrylic acid hydroxyethyl and/or hydroxypropyl ester or methacrylic acid hydroxyethyl and/or hydroxypropyl ester and being prepared at 50°–170° C. in the presence of 0.5–5.0% by weight, relative to the sum of the monomers, of an organic per-compound or an azo compound which supplies free radicals at 50°–170° C., in an organic solvent.

4,230,813

LOW PROFILE POLYESTER MOLDING COMPOSITION

Victor F. G. Cooke, Youngstown, and Donald H. Thorpe, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 838,793, Oct. 10, 1977, abandoned, and a continuation of Ser. No. 636,876, Dec. 2, 1975, abandoned. This application Dec. 26, 1978, Ser. No. 973,499

Int. Cl.[2] **C08F** *220/10, 212/36;* **C08L** *67/06*

U.S. Cl. 526—329 **7 Claims**

1. A low profile additive for molding compositions comprising discrete particles of less than about 50 microns diameter of a cross-linked styrene terpolymer characterized by a glass transition temperature of less than about 100° Celsius and consisting essentially of the reaction product of about 20 to about 60 weight percent styrene, about 25 to about 75 weight percent of at least one monounsaturated acrylate or methacrylate comonomer which has a glass transition temperature of below about 0° Celsius when hemopolymerized and which is selected from the group consisting of ethyl acrylate, isopropyl acrylate, n-butyl acrylate, isobutyl acrylate, s-butyl acrylate, 2-ethyl hexyl acrylate, n-hexyl methacrylate, n-octyl methacrylate, isodecyl methacrylate, tridecyl methacrylate, and mixtures thereof, and about 2 to about 25 weight percent of at least one polyunsaturated monomer.

4,230,814

HEAT CURABLE COMPOSITIONS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, NY

Filed Feb. 12, 1979, Ser. No. 11,102

Int. Cl.[2] **G03C** *1/6B*

U.S. Cl. 526—333 **8 Claims**

1. Heat curable compositions comprising

(A) a cationically polymerizable organic material

(B) an effective amount of a thermal curing agent capable of effecting the cure of the cationically polymerizable organic material consisting essentially of an organic oxidant selected from the class consisting of organic peroxides, azo-bis-alkyl-nitriles, and quinones selected from the class consisting of p-chloranil and 3,3',-5,5'-tetramethyl-4,4'-diphenoquinone and a dialkyl hydroxyl arylsulfonium salt having an anion of the formula, MQ_d, where M is a metal or metalloid, Q is a halogen radical and d is an integer equal to 4–6 inclusive.

4,230,815

SILICON-CONTAINING POLYBUTADIENE DERIVATIVES AND METHOD FOR THE PREPARATION THEREOF

Kunio Itoh, and Kimitaka Kumagae, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 752,173, Dec. 20, 1976, abandoned. This application Jul. 20, 1978, Ser. No. 926,298

Claims priority, application Japan, Dec. 23, 1975, 50-153540

Int. Cl.[2] **C08F** *8/00, 8/42*

U.S. Cl. 526—335 **4 Claims**

1. A derivative of a polybutadiene or a copolymer of butadiene in the liquid state with one or more copolymerizable monomers having in one molecule at least 15 mole % of all butadiene monomer units to which are bonded, through carbon-to-silicon linkages, silicon-containing groups having the general formula

$$(CH_3)_3Si—O—(CH_3)_2Si—.$$

4,230,816

THIOFUNCTIONAL POLYSILOXANE POLYMERS

Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Dec. 11, 1978, Ser. No. 968,153

Int. Cl.[3] **C08G** *77/06*

U.S. Cl. 528—12 **10 Claims**

1. A process for preparing thiofunctional polysiloxane polymers which comprises (1) reacting a cyclic trisiloxane with a hydroxy or hydrocarbonoxy containing organosilicon compound selected from the group consisting of silanes and siloxanes in the presence of a catalyst hhaving a pK value below 1, in which one of the silicon reactants contains at least one thiol group, to form a thiofunctional copolymer having at least one unit of the formula

$$[(R''S)_yR']_f—\overset{\overset{R_g}{|}}{SiO}\frac{4-f-g}{2}$$

and the other units are selected from the formulas R_2SiO, $R_3SiO_{0.5}$ and $RO_{0.5}$ and thereafter (2) equilibrating the thiofunctional polysiloxane copolymer with an organopolysiloxane containing at least four silicon atoms per molecule in the presence of an acid catalyst having a pK value of less than 1 in an aqueous solution, in which R is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R' is a substituted or unsubstituted divalent, trivalent or tetravalent hydrocarbon radical free of aliphatic unsaturation having from 1 to 18 carbon atoms, hydrocarbon ether, hydrocarbon thioether, hydrocarbon ester and hydrocarbon thioester radicals, R'' is a monovalent hydrocarbon radical or hydrogen, f is a number of from 1 to 3, and g is a number of from 0 to 1 and the sum of f+g is from 1 to 3 and y is a number of from 1 to 3.

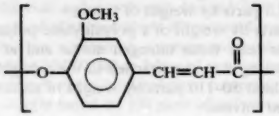
4,230,817

THERMOTROPIC POLYESTERS DERIVED FROM FERULIC ACID AND A PROCESS FOR PREPARING THE POLYESTERS

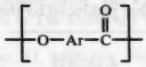
Larry F. Charbonneau, Morris, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 2, 1979, Ser. No. 17,007
Int. Cl.[2] C08G 63/06
U.S. Cl. 528—206 8 Claims

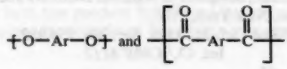
1. A thermotropic polyester capable of forming an anisotropic melt having the recurring unit:



and at least one recurring unit selected from the group consisting of:



and stoichiometrically balanced amounts of



wherein Ar is selected from the group consisting of unsubstituted aryl groups, compatibly substituted aryl groups and mixtures thereof.

4,230,818

REDUCTION OF GLYCOL ETHERS IN POLYESTERS

Roy M. Broughton, Jr., Auburn, Ala.; Douglas D. Callander, Akron; Brian W. Pengilly, Akron; Joseph P. Schirmer, Akron, and Terence E. Winters, Gates Mills, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 1, 1979, Ser. No. 16,673
Int. Cl.[3] C08G 63/18
U.S. Cl. 528—272 11 Claims

1. A process for reducing the glycol ether level in a polyester, comprising the steps of:

reacting a dicarboxylic acid having from 8 to 16 carbon atoms selected from the group consisting of an aryl, and an alkyl substituted aryl compound with a glycol having from 2 to 12 carbon atoms to form a polyester oligomer solution, the equivalent ratio of said glycol to said dicarboxylic acid ranging from about 0.5 to about 2.5;

subsequently adding after said reaction a vaporizable glycol containing from 2 to about 12 carbon atoms to said polyester oligomer solution;

pressurizing with an inert gas said polyester oligomer solution containing said added vaporizable glycol to a pressure of from about atmospheric to about 100 psi;

heating said oligomer solution to a temperature of from about 20° C. below to about 100° C. above the boiling point of said vaporizable glycol and generating vapors; and

distilling said vapors so that said vaporizable glycol and said ether contained in said vapor is removed from said oligomer solution.

4,230,819

ELIMINATING ACETALDEHYDE FROM CRYSTALLINE POLYETHYLENE TEREPHTHALATE RESIN

Jack D. Hauenstein, Tracy, Iowa, and Thomas E. Broderick, Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 13, 1979, Ser. No. 29,599
Int. Cl.[3] C08G 63/74
U.S. Cl. 528—483 3 Claims

1. The method of removing acetaldehyde from crystalline polyethylene terephthalate resin which comprises passing a dry inert gas through a bed of said resin at a temperature of from about 170° C. to about 250° C. in an amount sufficient to remove acetaldehyde and other degradation products from said resin.

4,230,820

PROCESS FOR THE PREPARATION OF ORGANOPOLYSILOXANE FOAMS

Adolph Maschberger, Burghausen, and Peter August, Seeveta, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,761
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1978, 2810921
Int. Cl.[3] C08J 9/00, 9/02
U.S. Cl. 521—77 5 Claims

1. A process for the preparation of organopolysiloxane foams which comprises rapidly heating a mixture consisting essentially of (A) a diorganopolysiloxane having terminal groups selected from the group consisting of hydroxyl groups, hydrocarbonoxy groups and mixtures thereof and having a viscosity of at least 500,000 mPa.s at 25° C., (B) a pyrogenically produced silicon dioxide having a surface area of at least 50 m^2/g, (C) a peroxide compound, (D) 2 to 20 parts by weight per 100 parts of diorganopolysiloxane (A) of an organopolysiloxane containing at least 2 and up to 9.2 weight percent of Si-bonded hydroxyl groups and (E) at least one organopolysiloxane containing Si-bonded hydrogen, to a temperature of from 280° to 320° C. at a pressure which does not exceed that of the surrounding atmosphere.

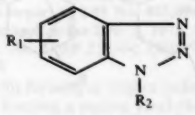
4,230,821

FIRE-RETARDANT POLYSTYRENIC COMPOSITIONS

Jean-Noël M. Bertrand, Wezembeek-Oppem, Belgium, assignor to Labofina, S.A., Brussels, Belgium

Filed Feb. 26, 1979, Ser. No. 15,399
Int. Cl.[2] C08K 5/02, 5/03, 5/34
U.S. Cl. 521—95 11 Claims

1. A self-extinguishing polystyrenic composition comprising a polystyrenic resin, a fire-retardant amount of a halogenated organic fire-retardant agent and a benzotriazolic compound having the formula



wherein R_1 is H or $-CH_3$ and R_2 is H or $-CH_2N(R_3)_2$ wherein R_3 is H, an alkyl radical containing from about 1 to 12 carbon atoms or $-CH_2CH_2OH$, in an amount between about 1 and 50% of the weight of said fire-retardant agent.

4,230,822

FLAME-RETARDANT POLYURETHANE FOAMS

Robert M. Murch, Brinklow, Md.; Phyllis I. Meyer, Madison, Wis., and John J. Eagan, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 795,216, May 9, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,038

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—106 27 Claims

1. In a crosslinked hydrophilic flame-retardant polyurethane foam prepared by reacting a hydrophilic polyoxyalkylene urethane prepolymer under foam-forming conditions with at least 20 moles of water for every mole of NCO groups in the prepolymer and in the presence of alumina hydrate and a phosphorous fire-retardant compound with said alumina hydrate carried in the water phase, the improvement comprising: incorporating, into the water phase prior to contact with the prepolymer in the foam-forming reaction, a water-dispersible and combustible organic carbon compound selected from the group consisting of a phenol having at least 2 hydroxyl groups per mole, starch, lignin, and wood cellulose, said carbon compound providing an essentially neutral pH when dissolved or dispersed in water, said carbon compound being present from about 5 to about 30 parts by weight based on 100 parts by weight of the prepolymer, provided that when said carbon compound is wood cellulose it is present from about 2 to about 10 parts by weight of the prepolymer, and said carbon compound not functioning as a gelatinizing agent at the concentration employed.

4,230,823

POLYURETHANE FOAMS AND ELASTOMERS BASED ON MODIFIED POLYETHER POLYOLS

Heinrich Alberts, Cologne, and Gerhard Balle, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,307

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2837026

Int. Cl.[2] C08G *18/14, 18/50;* C08K *5/06*

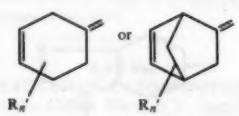
U.S. Cl. 521—137 15 Claims

1. A process for the preparation of modified polyether polyols comprising polymerizing of from 1 to 50 parts by weight of a mixture of 20 to 100% by weight (based on the total quantity of monomers) of acrylonitrile and 0 to 80% by weight of styrene in 50 to 99 parts by weight of the polyether polyol in the presence of a polymerization initiator which yields radicals, wherein said polymerization is carried out in the presence of from 0.1 to 1.5% by weight, based on the total quantity of monomers put into the process, of a compound of the formula:

A=CH—X—R

wherein

A represents a divalent group



R represents a C_{1-18} alkyl, C_{1-10} cycloalkyl, or substituted or unsubstituted benzyl group,

R' represents C_{1-8} alkyl group,

n represents 0, 1 or 2 and

X represents oxygen or sulfur.

4,230,824

SUCROSE BASED POLYETHER POLYOLS

Neil H. Nodelman, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 12, 1978, Ser. No. 914,266

Int. Cl.[3] C08G *18/50, 65/26, 18/14*

U.S. Cl. 521—167 11 Claims

1. In a process for the preparation of sucrose-based polyether polyols having a functionality of at least 6.5 and an OH number of 400 or less by the alkoxylation of sucrose with an alkylene oxide, the improvement which comprises reacting the alkylene oxide with a sucrose mixture containing:

(A) 100 parts by weight of sucrose;

(B) up to 1.3 parts by weight of water;

(C) 4–50 parts by weight of a polyalkylene polyamine containing at least three nitrogen atoms and at least four active hydrogen atoms attached to the nitrogen atoms;

(D) from about 50–110 parts by weight of an aromatic hydrocarbon solvent.

11. In a process for the preparation of rigid polyurethane foam in which polyisocyanates are reacted with compounds containing active hydrogen atoms in the presence of a blowing agent and other auxiliary components, the improvement which comprises using as the active hydrogen containing compound a sucrose-based polyether produced by the process of claim 1.

4,230,825

UNIFORM HYDROLYSIS CATALYST ADDITION TO ETHYLENE-VINYL ESTER POLYMERS

Michael F. Hardy, Cincinnati, Ohio, and Terry Tgavalekos, Peabody, Mass., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,959

Int. Cl.[3] C08F *8/12*

U.S. Cl. 525—62 8 Claims

1. In the process for the alcoholysis of an ethylene-vinyl ester interpolymer containing from 3 to 45 weight percent of vinyl ester in a reaction medium comprising as components thereof said interpolymer, a low-boiling alcohol, a hydrocarbon solvent and an alkaline or acidic catalyst, the hydrocarbon solvent and low-boiling alcohol being incorporated in the reaction medium in the proportion from about 1:5 to about 10:1 parts by volume, wherein the interpolymer is incorporated in the reaction medium in an amount of from about 20 to about 50 percent by weight of the hydrocarbon solvent and low-boiling alcohol the improvement which comprises adding the catalyst to the alcoholysis reaction medium during the reaction within a period of from about 0.1 to about 20 minutes at a substantially uniform rate which does not vary over the period of catalyst addition by more than about ±25% to thereby provide an alcoholyzed interpolymer in which discoloration is inhibited or suppressed.

4,230,826

ORGANOPOLYSILOXANE COMPOSITIONS AND ELASTOMERS FORMED THEREFROM

Oswin Sommer, Burghausen; August Schiller, Marktl; Norman Dorsch, and Alois Strasser, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1979, Ser. No. 33,280

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823011

Int. Cl.[3] C08L *83/06, 33/20*

U.S. Cl. 525—100 5 Claims

1. A composition which can be stored under anhydrous conditions but which cross-links to form an elastomer when exposed to moisture at room temperature, comprising (1) an organopolysiloxane having terminal condensable groups, (2) a silicon compound having at least 3 Si-bonded hydrolyzable groups per molecule and (3) from 30 to 100 percent by weight based on the weight of the organopolysiloxane (1) of a powder

obtained from the polymerization of an acrylonitrile in an aqueous medium.

4,230,827

ETHYLENE OXIDE POLYMERS AS IMPACT MODIFIERS FOR PVC

Robert M. Myers, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 6, 1978, Ser. No. 966,935
Int. Cl.[2] C08L 27/06
U.S. Cl. 525—121 8 Claims

1. Composition comprising an impact-resistant blend of polyvinyl chloride and a polymer derived from a monomer system comprised of at least about 80 percent by weight ethylene oxide having a viscosity average molecular weight of about 200,000 to 10,000,000 and free of pendant epoxy groups along the polymer chain, said polymer comprising about 1 to 30 parts by weight based on 100 parts of polyvinyl chloride in the blend.

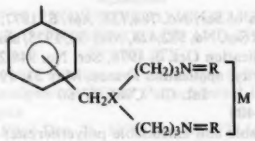
4,230,828

POLYMER BOUND MULTIDENTATE COMPLEXES

John H. Gaul, Jr., Midland, Mich., and Russell S. Drago, Champaign, Ill., assignors to The University of Illinois Foundation, Urbana, Ill.

Filed Dec. 11, 1978, Ser. No. 968,123
Int. Cl.[2] C08F 8/30, 8/32, 8/28, 8/04
U.S. Cl. 525—153 9 Claims

5. A polymer bound multidentate metal complex comprising an insoluble crosslinked polymer support and, attached thereto, at least one pendant Schiff base ligand containing the metal complex, the complexed ligand being represented by the formula



where X is nitrogen or phosphorus, R is derived from a carbonyl compound selected from the group consisting of aldehydes and ketones, and M is a metal selected from the group consisting of Co(II), Mn(II), Ni(II), Cu(II), Zn(II), Fe(II), and Fe(III).

4,230,829

POWDERY COATING COMPOSITION

Ichiro Yoshihara; Tadashi Watanabe, and Osamu Iwase, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Dec. 13, 1978, Ser. No. 969,195
Claims priority, application Japan, Dec. 21, 1977, 52-154916
Int. Cl.[3] C08L 61/28
U.S. Cl. 525—162 14 Claims

1. A powdery coating composition comprising (1) 10 to 40% by weight of a solid cross-linking agent having softening point of 50° to 120° C. and prepared by heating 40 to 70% by weight of polyester having free hydroxyl groups with 60 to 30% by weight of an alkoxyaminotriazone at a temperature of 50° to 120° C. in the presence of a solvent for 1 to 6 hours, and (2) 90 to 60% by weight of a polyester, acrylic resin or mixtures thereof having a softening point of 60° to 130° C. and an acid value of up to 30 and containing 0.4 to 2.0 moles of free hydroxyl groups per kilogram of the resin, the alkoxyaminotriazine having 0 to 1 non-methylolated NH bond per triazine ring, at least 80% of the methylol groups of the alkoxyaminotriazine having been alkoxylated with alcohol.

4,230,830

ADHESIVE BLENDS CONTAINING THERMALLY GRAFTED ETHYLENE POLYMER

Stephen R. Tanny, and Philip S. Blatz, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1979, Ser. No. 25,564
Int. Cl.[2] C08L 23/26
U.S. Cl. 525—222 6 Claims

1. A polymer blend consisting essentially of

a. about from 80–99% by weight of a first olefinic polymer selected from

(i) non-polar ethylene polymers and copolymers having a density of 0.930 to 0.965 g/cc and

(ii) copolymers of ethylene having up to about 30 weight percent of at least one ethylenically unsaturated ester having from 4 to 12 carbon atoms; and

b. about from 1–19% of a second olefinic polymer selected from the group consisting of

(i) non-polar ethylene polymers and copolymers having a density of about from 0.945 to 0.965 g/cc and

(ii) terpolymers of ethylene, at least one α-olefin having from 3–6 carbon atoms, and at least one nonconjugated diene;

the second olefinic polymer being thermally grafted with unsaturated acid or anhydride to give a copolymer having about from 0.02 to 4.0 weight percent of grafted succinic groups, provided, however, that when the second olefinic polymer is (ii), then the first olefinic polymer is (ii).

4,230,831

POLYETHYLENE BLEND COMPOSITION

Hisaya Sakurai; Yoshihiko Katayama; Tadashi Ikegami; Kisoo Moriguchi, and Shigeru Mizutani, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1979, Ser. No. 78,737
Claims priority, application Japan, May 18, 1979, 54-60387
Int. Cl.[2] C08L 23/06
U.S. Cl. 525—240 20 Claims

1. An intimately melted and homogenized polyethylene composition comprising a high-medium density polyethylene having a high molecular weight (A), a high-medium density polyethylene having a low molecular weight (B) and a low density polyethylene (C):

(i) the average molecular weight of said (A) being 100,000–1,000,000, the average molecular weight of said (B) being 1,000–100,000, the molecular weight ratio of (A) to (B) being 5 to 200, and said (C) having an intrinsic viscosity [η] of 0.70 dl/g or more in decalin at 135° C. and an expansion factor of 3.3 or more; and

(ii) the mixing ratio (A)/(B) being 30/70 to 80/20 and the mixing ratio of (C) in the composition being within the range from 1% by weight to less than 15% by weight.

4,230,832

PROCESS FOR PREPARING RESISTANT VINYL HALIDE POLYMERS

Chung H. Wei, Wilmington, Del., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 497,546, Aug. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 402,494, Oct. 1, 1973, abandoned. This application Dec. 2, 1975, Ser. No. 636,878
Int. Cl.[3] C08L 27/06; C08F 259/04; C08L 47/00; C08F 2/20
U.S. Cl. 525—260 2 Claims

1. In a process for forming an impact resistant vinyl chloride polymer by first forming a porous vinyl chloride polymer by suspension polymerization using a suspending agent followed by polymerizing a monomer composition adapted to form a rubber containing interpolymer having a Tg of less than 25° C. in the presence of the porous vinyl chloride polymer, wherein the improvement comprises using a catalyst system of from

about 0.003% to about 0.6% by weight of a water soluble, free radical polymerization catalyst in combination with from about 0.005% to about 1.0% by weight of a monomer soluble, free radical polymerization catalyst during the suspension polymerization of the vinyl chloride and using polyvinyl alcohol as the suspending agent.

4,230,833

SINGLE STAGE CONTINUOUS GRAFT POLYMERIZATION PROCESS AND PRODUCT

Marshall T. Purvis, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 8, 1979, Ser. No. 10,356
Int. Cl.[2] C08F *279/02, 279/06*
U.S. Cl. 525—260 **15 Claims**

1. A single stage process comprising continuously introducing a solution of synthetic rubber in a monomer system comprising methyl methacrylate into a single reactor in the presence of a free radial initiator, continuously stirring said solution to create a trubulent flow, controlling the temperature at about 161 to 195° C., controlling the average residence time to below 90 minutes, and continuously removing the resultant graft polymer having a dispersed rubber phase and a continuous hard phase from said reactor.

4,230,834

PRIMERS FOR POLYMERIZABLE ACRYLATE-CHLOROSULFONATED POLYETHYLENE ADHESIVES AND TWO-PART ADHESIVES PREPARED THEREWITH

Julius Sirota, South Plainfield, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 14, 1978, Ser. No. 969,610
Int. Cl.[3] C08L *61/22, 33/12*
U.S. Cl. 525—308 **9 Claims**

6. A two-part adhesive which comprises a joined mixture of (1) an acrylate or methacrylate monomer, a chlorosulfonated polyethylene and a peroxy polymerization initiator and (2) an aldehyde-amine condensation product and a salt of a non-transition metal selected from the group consisting of lead, tin, zinc, calcium, barium, strontium and cadmium wherein the aldehyde-amine condensation product is used in an amount of 0.15 to 5% and the non-transition metal salt in an amount of 0.00001 to 0.5% by weight of the adhesive composition and wherein the ratio of the aldehyde-amine condensation product to the non-transition metal salt is within the range of 1:1 to 15:1.

4,230,835

METHOD OF REMOVING POLYBUTADIENE GELS FROM SOLUTIONS

Richard C. Weil, Monroeville Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1979, Ser. No. 11,350
Int. Cl. C08f *279/02*
U.S. Cl. 525—316 **6 Claims**

1. Method of removing gels from a solution of polybutadiene in styrene comprising passing the solution through a filter medium of viscose rayon felt.

4,230,836

CHEMICALLY CROSS-LINKED POLY(P-METHYLSTYRENE)

Peter J. Canterino, Towaco, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 870,778, Jan. 19, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,603
Int. Cl.[2] C08F *8/00*
U.S. Cl. 525—332 **3 Claims**

1. A chemically cross-linked polymer of methyl ethenyl benzene derived from a polymerizable mixture of isomers of methyl ethenyl benzene consisting essentially of less than 10 percent by weight 1-methyl-3-ethenyl benzene, at least 90 percent by weight 1-methyl-4-ethenyl benzene, and 0 to 0.1 percent 1-methyl-2-ethenyl benzene.

4,230,837

OLEFIN CONTAINING POLYMERS TREATED WITH OXYCARBONYLSULFENYL HALIDES

Stanley J. Brois, Westfield, and Gary Ver Strate, Matawan, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 634,266, Nov. 21, 1975, abandoned. This application Feb. 2, 1978, Ser. No. 874,656
Int. Cl.[2] C08F *8/34;* C08C *19/20;* C08J *3/24*
U.S. Cl. 525—343 **6 Claims**

1. A method for chemically modifying and crosslinking polymers having olefin unsaturation so as to provide said polymers with hydroxyl functionality, said polymers being selected from the group consisting of synthetic and natural hydrocarbon elastomers, vinyl and vinylidene polymers, olefinically unsaturated acrylic polymers, polyvinyl esters and copolymers thereof, unsaturated polyesters and allyl polymers, which comprises reacting said polymer at the site of the olefinic linkage with an aliphatic organic oxycarbonylsulfenyl chloride of the general formula $R(OC(:O)SCl)_n$ wherein n is an integer of at least 2 and R represents a saturated aliphatic radical being the residual portion of a polyhydric alcohol or a polyalkylene ether polyol containing residual hydroxyl functionality.

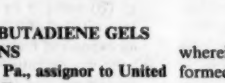
4,230,838

MOULDABLE AND EXTRUDABLE POLYETHER-ESTER-AMIDE BLOCK COPOLYMERS

Paul Foy, Paris; Camille Jungblut, and Gérard E. Deleens, both of Orsay, all of France, assignors to ATO Chimie, Courbevoie, France

Continuation of Ser. No. 784,723, Apr. 5, 1977, which is a continuation of Ser. No. 582,428, May 30, 1975, abandoned. This application Oct. 3, 1978, Ser. No. 948,297
Claims priority, application France, May 31, 1974, 74 18913
Int. Cl.[2] C08L *77/00*
U.S. Cl. 525—408 **11 Claims**

1. A mouldable and extrudable polyetherester-amide block copolymer having the formula:



wherein A is a linear saturated aliphatic amide sequence formed from a lactam or amino acid having a hydrocarbon chain containing 4 to 14 carbon atoms, or from a dicarboxylic acid and a diamine, wherein said diacid is in aliphatic carboxylic diacid having 4 to 40 carbon atoms; said amide having an average molecular weight between 800 and 5000; and B is a polyether sequence formed from linear or branched aliphatic polyoxyalkylene glycols, mixtures thereof or copolyethers derived therefrom, said polyethers having a molecular weight of from 400 to 3000; wherein the proportion by weight of polyoxyalkylene glycol with respect to the total weight of polyether-ester-amide is from 5 to 50%; and n indicates a sufficient number of repeating units so that said polyether-ester-amide has an intrinsic viscosity of from 0.8 to 2.05; said polyether-ester-amide being obtained by reacting in the fused state a dicarboxylic saturated polyamide having carboxylic chain ends and an average molecular weight of 300 to 15,000 with a linear or branched aliphatic polyoxyalkylene glycol having hydroxylic chain ends and an average molecular weight of 200 to 6,000, said reaction being carried out under high vacuum at a temperature between 100° and 400° C. in the presence of a catalyst comprising a tetra-alkylortho-titanate

having the formula $Ti(OR)_4$, wherein R is a linear or branched aliphatic hydrocarbon radical having from 1 to 24 carbon atoms, the amount of said catalyst with respect to the reactive mixture is between 0.01 and 5% by weight.

4,230,839
QUATERNARY AMMONIUM ADDUCTS OF POLYMERIZABLE TERTIARY AMMONIUM SALTS AND ACRYLONITRILE

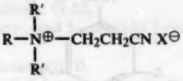
Rudolf S. Buriks; Allen R. Fauke, and David W. Griffiths, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 523,813, Nov. 24, 1974. This application Oct. 27, 1978, Ser. No. 955,443

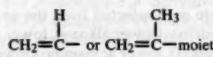
Int. Cl.[2] **C08F** *2/00, 11/04, 220/60, 226/00*

U.S. Cl. 526—75 **8 Claims**

1. A polymer which is a homopolymer or copolymer of a monomer which is a quaternary ammonium adduct of the formula



where R is a polymerizable group terminated in



the R′ groups are alkyl groups, X is an anion, and where the quaternary nitrogen is attached to four carbon atoms.

4,230,840
PROCESS FOR PRODUCING HYDROCARBON RESINS HAVING IMPROVED COLOR AND THERMAL STABILITY

Shigeru Katayama, Iwakuni, and Mutsuhiro Aoki, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,445

Int. Cl.[2] **C08F** *240/00*

U.S. Cl. 526—77 **23 Claims**

1. A process for producing a hydrocarbon resin having improved color and thermal stability, which comprises contacting a petroleum cracking or reforming fraction containing at least 20% by weight of cationically polymerizable hydrocarbons and not more than 0.7% by weight, based on the fraction, of cyclopentadienes and having a boiling range of from 140° C. to 280° C., with 0.8 to 3.0 moles, per mole of the cyclopentadienes, of a dienophile compound having a carbon-to-carbon double bond and a carbonyl or cyano group adjacent to the double bond; and then polymerizing the treated petroleum fraction in the presence of a polymerization catalyst.

4,230,841
PROCESS FOR MEDIUM VINYL POLYBUTADIENE

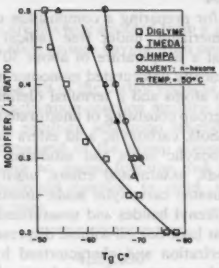
Robert T. Prudence, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 31, 1979, Ser. No. 7,741

Int. Cl.[3] **C08F** *236/06, 36/06, 4/48*

U.S. Cl. 526—179 **4 Claims**

1. A process for the preparation of medium vinyl polybutadiene which comprises copolymerizing butadiene with small amounts of divinylbenzene in a hydrocarbon solvent system employing as a catalyst an alkyllithium compound, which process has been modified by mixtures of polar compounds, at least one of which is a strong polar compound and is selected from the group consisting of hexamethylphosphoric acid triamide (HMPA), N,N,N′N′-tetramethylethylene diamine (TMEDA), ethylene glycol dimethyl ether (glyme), diethylene glycol dimethyl ether (diglyme), triethylene glycol dimethyl ether (triglyme) and tetraethyleneglycol dimethyl ether (tetraglyme), in which the mole ratio of the strong polar compound to the alkyllithium ranges between about 0.15/1 and 0.50/1, and at least one of which is a weak polar compound and is selected from the group consisting of tetrahydrofuran (THF), 1,4-diazobicyclo[2.2.2]octane (DABCO), diethylether, triethylamine, tri-n-butylamine, tri-n-butylphosphine and p-dioxane, in which the mole ratio of the weak polar compound to the alkyllithium ranges between about 0.90/1 to about 1.50/1, in which the temperature is maintained constant throughout the polymerization and in which the mole ratio of the divinylbenzene to active alkyllithium catalyst ranges between about 0.10 and about 0.90, and in which the amount of alkyllithium catalyst is between about 0.10 and 1.0 millimoles of active alkyllithium per hundred grams of butadiene.



4,230,842
HYDROCARBON RESIN

Herbert L. Bullard, Norton Village, and Robert A. Osborn, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 552,690, Feb. 24, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,635

Int. Cl.[3] **C08F** *210/08*

U.S. Cl. 526—185 **4 Claims**

1. A hydrocarbon-derived, tack enhancing, piperylene/2-methyl-2-butene backboned resin, modified with a minor amount of α-methylstyrene, characterized by having a softening point in the range of about 85° C. to about 100° C. prepared by the method which consists essentially of reacting at a temperature in the range of 10° C. to about 50° C. in the presence of a solvent selected from at least one of hexane, heptane and unreacted hydrocarbons and a catalyst selected from at least one of aluminum chloride and ethylaluminum dichloride, a monomer mixture consisting of about 88 to about 98 weight percent of a diolefin/olefin mixture in a weight ratio in the range of about 0.6/1 to about 1.4/1 and, correspondingly, about 12 to about 2 weight percent α-methylstyrene, where said diolefin is piperylene, optionally modified by containing up to about 5 weight percent isoprene based on the piperylene/isoprene mixture, where said olefin is 2-methyl-2-butene and where said polymerization monomer mixture is optionally modified by containing up to about 10 weight percent of at least one of the group selected from piperylene dimers, piperylene trimers, 2-methyl-1-butene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, cyclopentene and 1,3-cyclopentadiene based on the total monomer mixture.

4,230,843

POLYMERIC COMPOSITIONS, METHOD FOR THEIR PREPARATION, AND LUBRICANTS CONTAINING THEM

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 433,322, Jan. 14, 1974. This application Feb. 2, 1979, Ser. No. 8,737
Int. Cl.[3] C08F *2/08*
U.S. Cl. 526—204 6 Claims

1. A method for preparing a composition of matter which comprises polymerizing, under free radical polymerization conditions and at a temperature of about 30°–90° C., (A) at least one ethylenically unsaturated monomer having from 3 to about 10 carbon atoms and a terminal olefinic bond and selected from the group consisting of unsaturated monohydric or polyhydric alcohols, carboxylic acid esters thereof, esters of unsaturated carboxylic acids and saturated alcohols, vinyl cyclic compounds, unsaturated ethers, unsaturated ketones, amides of unsaturated carboxylic acids, unsaturated aliphatic hydrocarbons, alkenyl halides and unsaturated nitriles; in the presence of (B) at least one oil-soluble dispersant incapable of addition polymerization and characterized by the presence within its molecular structure of an acyl or acylimidoyl radical containing at least about 34 carbon atoms and an oxygen atom attached directly to said acyl or acylimidoyl radical, said oxygen atom also being attached to a hydrocarbon radical or a substituted hydrocarbon radical in which the substituents do not alter significantly the character or reactivity of the radical and comprise no more than about 10% by weight of said radical.

4,230,844

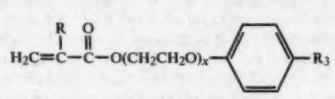
PROCESSES FOR THE PREPARATION OF POLYMERIC THICKENERS AND USES THEREOF

David C. Chang, Springfield; Michael Fryd, Philadelphia, both of Pa., and Achim R. Krueger, Cherry Hill, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 770,364, Feb. 22, 1977, abandoned, which is a division of Ser. No. 643,390, Dec. 22, 1975, abandoned, which is a continuation of Ser. No. 525,008, Nov. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,200, Nov. 15, 1973, abandoned. This application Sep. 28, 1978, Ser. No. 946,715
Int. Cl.[3] C08F *2/06, 2/10*
U.S. Cl. 526—210 1 Claim

1. A process for preparing a polymer useful as a thickening agent in aqueous polymeric latices comprising:

(a) adding to a reaction zone about 10 to 50% by weight of the total of the monomers and sufficient ethylene glycol or propylene glycol, with 0 to about 50% by weight of water based on the weight of glycol, to give a final product having a solids content between 5 and 35% by weight, said monomers consisting essentially of (i) about 30–65% by weight of acrylic acid or methacrylic acid, and (ii) about 70–35% by weight of an ester of the formula



wherein
R is hydrogen or methyl,
x is a positive integer of 10 to 50, and
R_3 is an alkyl group of 8 to 20 carbon atoms;

(b) heating the mixture of (a) to a temperature in the range of about 70° to 110° C.;

(c) adding to the reaction zone about 2 to 50% by weight of the total of a free-radical polymerization catalyst dissolved in a solvent;

(d) continuously feeding to the reaction zone the remainder of the monomers and catalyst; and

(e) cooling the reaction product and then adding ammonia or a water-soluble organic amine after the polymerization is complete to adjust the pH to about 7 to 10.

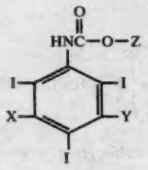
4,230,845

POLYHYDROXY-ALKYL-3,5-DISUBSTITUTED-2,4,6-TRIIODOCARBANILATES

Kenneth R. Smith, Black Jack, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 512,004, Oct. 4, 1974, Pat. No. 4,125,709. This application Aug. 31, 1978, Ser. No. 938,342
Int. Cl.[3] C07H *13/12;* C07C *102/00, 103/20*
U.S. Cl. 536—4 7 Claims

1. A compound of the formula:



wherein X and Y are each selected from the group consisting of lower alkoxy, hydroxy-(lower alkoxy), lower alkoxy-(lower alkoxy), lower acylalkyl), lower acylamino-(lower acylamino), hydroxy-lower acylamino, N-(lower alkyl)-lower acylamino, lower alkylsulfonamido, N-(lower alkyl)-lower alkylsulfonamido, 3,3-bis-(lower alkyl)-ureido, lower perfluoroacylamino, carbamyl, N-(lower alkyl) carbamyl, N,N-di-(lower alkyl) carbamyl, lower alkoxy-(lower acylamino), lower alkoxy-alkoxy(lower acylamino), hydroxy and hydroxy-lower alkyl functions and Z is the monovalent residue of a polyol selected from the group consisting of cyclic polyols, acylamino polyols and alkyl glycosides, said monovalent residue containing not more than 7 carbon atoms in its chain or ring.

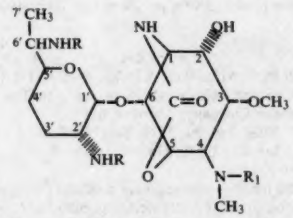
4,230,846

1,5-CARBAMATES OF FORTIMICIN B AND DERIVATIVES

John S. Tadanier, and Jerry R. Martin, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 26, 1979, Ser. No. 79,133
Int. Cl.[3] C07H *17/00*
U.S. Cl. 536—4 14 Claims

1. A 1,5-fortimicin B carbamate represented by the formula:



wherein each R is hydrogen or benzyloxycarbonyl and R_1 is selected from the group consisting of: loweralkyl, hydroxy-loweralkyl, hydrogen, aminoloweralkyl, N-loweralkylamino-loweralkyl, N,N-diloweralkylaminoloweralkyl, trihaloalkoxycarbonyl, an amino acid residue and an N-protected amino acid residue and the pharmaceutically acceptable salts thereof.

4,230,847
AMINOGLYCOSIDE ANTIBIOTIC COMPOUNDS

Tattanahalli L. Nagabhushan, Parsippany; William N. Turner, Bloomfield, and Alan Cooper, West Caldwell, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 697,297, Jun. 17, 1976, Pat. No. 4,136,254. This application May 18, 1978, Ser. No. 906,895
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—10 **4 Claims**

1. A 3,2',6'-tri-N-acyl-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol selected from the group consisting of
3,2',6'-tri-N-Y-sisomicin, 3,2',6'-tri-N-Y-verdamicin,
3,2',6'-tri-N-Y-tobramycin, 3,2',6'-tri-N-Y-gentamicin C_1,
3,2',6'-tri-N-Y-gentamicin C_{1a}, 3,2',6'-tri-N-Y-gentamicin C_2,
3,2',6'-tri-N-Y-gentamicin C_{2a}, 3,2',6'-tri-N-Y-gentamicin C_{2b},
3,2',6'-tri-N-Y-Antibiotic 66-40B,
3,2',6'-tri-N-Y-Antibiotic 66-40D,
3,2',6'-tri-N-Y-Antibiotic JI-20A,
3,2',6'-tri-N-Y-Antibiotic JI-20B,
3,2',6'-tri-N-Y-Antibiotic G-52,
the 5-epi-, 5-deoxy-, and 5-epi-azido-5-deoxy analogs of the foregoing;
3,2',6'-tri-N-Y-kanamycin B,
3,2',6'-tri-N-Y-3',4'-dideoxykanamycin B,
3,2',6'-tri-N-Y-nebramycin factor 4,
3,2',6'-tri-N-Y-nebramycin factor 5',
3,2',6'-tri-N-Y-3',4'-dideoxy-3',4'-dehydrokanamycin B, and
3,2',6'-tri-N-Y-3',4'-dideoxy-6'-N-methylkanamycin B;
wherein Y is an acyl blocking group.

4,230,848
PROCESS FOR PRODUCING 3-O-DEMETHYLFORTIMICINS

William Rosenbrook, Jr., Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,238
Int. Cl.² C07H *15/22*
U.S. Cl. 536—17 R **12 Claims**

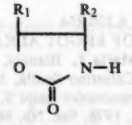
1. A method of O-demethylating a fortimicin antibiotic comprising the steps of dissolving a fortimicin to be O-demethylated in an inert solvent, cooling the resulting solution to a temperature of from −72° to 4° C., treating said cooled solution with a boron trihalide and thereafter recovering the O-demethylated antibiotic from the reaction mixture.

4,230,849
PROCESS FOR THE ACTIVATION OF CARBOXYLIC ACIDS

Antonio L. Palomo Coll, and Jose Diago Meseguer, both of Barcelona, Spain, assignors to Antibioticos, S.A., Spain

Filed Jul. 2, 1979, Ser. No. 53,804
Int. Cl.² C07D *499/00, 501/02*
U.S. Cl. 544—28 **4 Claims**

1. A process for the activation of carboxylic acids, useful for the subsequent conversion of said carboxylic acids into their corresponding esters or amides, comprising the steps of
(a) reacting one equivalent of a 2-oxazolidinone of the general formula



(II)

wherein R_1 and R_2 are selected from a group consisting of hydrogen and alkyl groups having from one to four carbon atoms, with a solvent with at least one half equivalent of phosphorus pentachloride at temperatures from −15° C. to +100° C. to yield P-trichlorinated N,N'-bis-3(oxazolydinyl-2-one) phosphoranes of the formula

(Ia)

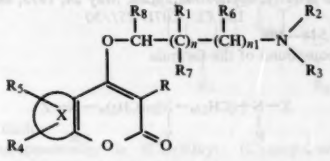
where R_1 and R_2 are likewise selected from a group consisting of hydrogen and alkyl groups having from one to four carbon atoms;
(b) then adding a salt of the carboxylic acid to be activated, to obtain an activation reaction mixture; and
(c) treating the resulting activation reaction mixture with one of a compound of the group comprising the compounds having an amine function and the compounds having a hydroxyl function to yield, respectively, an amide or an ester.

4,230,850
3-SUBSTITUTED-4-AMINOALKOXY-5,6-CONDENSED RING-2-PYRANONES

Philippe Briet; Jean-Jacques Berthelon, and Jean-Claude Depin, all of Lyons, France, assignors to LIPHA, Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation of Ser. No. 768,745, Feb. 15, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 18,875
Claims priority, application France, Feb. 25, 1976, 76 05234
Int. Cl.³ C07D *413/12, 311/56*
U.S. Cl. 544—151 **6 Claims**

1. A substituted pyranone represented by the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein:
n is 0 or 1;
n_1 is 0 or 1;
R is lower alkyl, phenyl, phenyl substituted by at least one halogen atom or lower alkoxy group, or benzyl;
R_1 is hydrogen, a hydroxy or lower alkyl group, or a 3,4,5-trialkoxybenzoyloxy radical;
R_2 is a straight-chain or branched lower alkyl group;
R_3 is hydrogen or lower alkyl; or
R_1 and R_2 are joined together to form with the adjacent nitrogen atom a saturated heterocyclic ring with n being 1 and n_1 being 0, or
R_2 and R_3 are joined together to form with the adjacent nitrogen atom a saturated heterocyclic ring optionally containing a further hetero atom;
X is benzene, cyclohexene, cycloheptene, cyclooctaene, cyclododecaene, naphthalene, dihydronaphthalene, or indeno (2,1–6) pyrano;
R_4 is H, halogen, hydroxy, lower alkyl, lower alkoxy, morpholinoalkoxy or phenyl;
R_5 is H, a substituent selected from hydroxy, straight-chain or branched lower alkyl, lower alkoxy and morpholinoalkoxy groups;
R_6 is hydrogen or a lower alkyl group;
R_7 is hydrogen or a lower alkyl group; and
R_8 is hydrogen or a lower alkyl group.

4,230,851

PROCESS FOR THE PRODUCTION OF 2-EQUIVALENT YELLOW COUPLERS

Günter Renner, and Quirin Scheben, both of Cologne, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1979, Ser. No. 74,895

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840381

Int. Cl.[3] C07D *253/04, 239/88, 233/64, 473/08*

U.S. Cl. 544—183 5 Claims

1. The process for the production of a 2-equivalent α-acylacetamide yellow coupler substituted in the α-position with an organic substituent selected from the group consisting of phenoxy groups and groups derived from NH acidic organic compounds by removal of the acidic hydrogen atom in which process a 2-equivalent α-halo-α-acylacetamide yellow coupler is reacted with a compound selected from the group consisting of phenols and NH-acidic organic compounds in the presence of a basic condensing agent, in which process the improvement comprises using as basic condensing agent a non-alkylatable bicyclic nitrogen-containing base containing from 6 to 14 carbon atoms and at least 2 nitrogen atoms.

4,230,852

TRIAZINYL-ANTRAQUINONE DYES

Yoshihisa Sueda, Toyonaka; Suketsugu Koumura, Ibaragi; Kazuyoshi Hirabayashi, Ikeda; Hirohito Kenmochi, Takatsuki; Hisashige Terao, Toyonaka, and Yoshio Mori, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

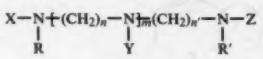
Division of Ser. No. 788,444, Apr. 18, 1977, Pat. No. 4,148,790, which is a division of Ser. No. 471,986, May 21, 1974, Pat. No. 4,038,267. This application Dec. 18, 1978, Ser. No. 970,336

Claims priority, application Japan, May 24, 1973, 48/58829

Int. Cl.[3] C07D *251/50*

U.S. Cl. 544—189 1 Claim

1. A compound of the formula



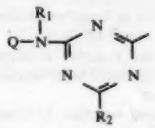
wherein

R and R′ each are hydrogen, C_1–C_4 alkyl or C_1–C_4 hydroxyalkyl,

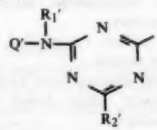
m is an integer from 1 to 6,

n and n′ are each an integer from 2 to 4, and when m is 2 or more, n may be the same or different between 2 and 4,

X is hydrogen or a group of the formula

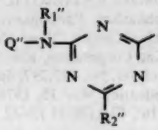


Y is hydrogen or a group of the formula



and

Z is hydrogen or a group of the formula

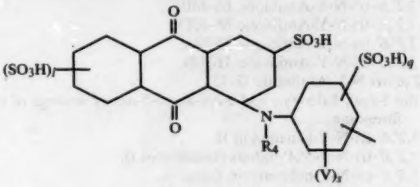


wherein

R_1, R_1', and R_1'' each are hydrogen or C_1–C_4 alkyl,

R_2, R_2', and R_2'' each are halogen, and

Q, Q′, and Q″ each are dye residues and are independently one member selected from the group consisting of members of the formulae as a free acid form



wherein

R_4 is hydrogen or C_1–C_4 alkyl,

V is halogen or methyl,

l and q are each 0, 1, or 2 and

s is 0, 1, or 3 with the proviso that X, Y, and Z are not hydrogen at the same time.

4,230,853

PROCESS FOR PREPARING CHLORO-BIS(ALKYLAMINO)-s-TRIAZINES

Vittorio Messori, and Renato Francese, both of Turin, Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Oct. 1, 1979, Ser. No. 80,720

Claims priority, application Italy, Sep. 29, 1978, 28219 A/78

Int. Cl.[3] C07D *251/50*

U.S. Cl. 544—204 11 Claims

1. In a process for preparing chloro-bis(alkylamino)-s-triazine by step-wise replacement of two chlorine atoms of cyanuric chloride by means of alkylamino groups in an alkaline medium comprising water and a liquid organic compound which is a solvent for cyanuric chloride, in which a molar excess of alkylamine is used in the second replacement step, the method of suppressing the formation of tris(alkylamino)-s-triazines which comprises adding to the reaction mixture, after the second chlorine atom has been replaced with an alkylamino group, an oxidizing agent selected from the group consisting of hydrogen peroxide and alkali metal hypochlorites, persulphates and permanganates, in an amount of at least 1 equivalent for every mole of unreacted alkylamine present in the said reaction mixture.

4,230,854

ANALOGUES OF ERGOT ALKALOIDS

Enzo Beacco, Limbiate; Maria L. Bianchi, Milan; Annacleto Minghetti, Milan, and Celestino Spalla, Milan, all of Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

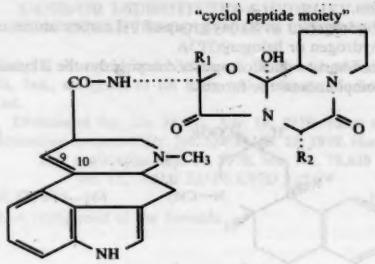
Filed Mar. 21, 1978, Ser. No. 888,750

Claims priority, application United Kingdom, Apr. 19, 1977, 16096/77

Int. Cl.[2] C07D *511/02*

U.S. Cl. 544—346 1 Claim

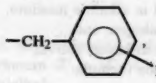
1. Ergot alkaloids of formula



and their 9,10 dihydroderivatives, wherein

R_1 is selected from the group consisting of methyl, ethyl and isopropyl;

R_2 is selected from the group consisting of



halogen-substituted linear C_3–C_5 alkyl-group and halogen-substituted isobutyl-group;

R_3 being selected from the group consisting of C_1–C_4 alkyl and halogen.

4,230,855

METHOD OF PREPARATION OF IMPROVED NIGROSINE AND INDULINO DYES

Mario Capaccioni, Milan; Laurentino Gentile, Cogliate, and Aldo Rusconi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 30, 1978, Ser. No. 955,798
Claims priority, application Italy, Oct. 31, 1977, 29174 A/77
Int. Cl.³ C07D *241/36*
U.S. Cl. 544—348 **2 Claims**

1. A process for preparing a nigrosine base or an induline base having improved dispersibility, fluidity and flowability in the coloring of plastics and in the preparation of inks, comprising treating a nigrosine base or induline base, at a temperature between 135° and 150° C., with between 15 and 30% by weight of phthalic anhydride, based on the weight of the base.

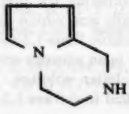
4,230,856

1,2,3,4-TETRAHYDROPYRROLO-[1,2-A]-PYRAZINE

Alexandr P. Skoldinov, ulitsa Alabiana, 3, kv. 60; Arkady M. Likhosherstov, ulitsa Smolnaya, 33, kv. 107, and Vitaly P. Peresada, ulitsa Astradamskaya, 8, kv. 31, all of Moscow, U.S.S.R.

Filed Jul. 26, 1978, Ser. No. 927,995
Int. Cl.² A61K *31/495*; C07D *487/04*
U.S. Cl. 544—349 **1 Claim**

1. 1,2,3,4-Tetrahydropyrrolo-[1,2-a]-pyrazine of the formula:



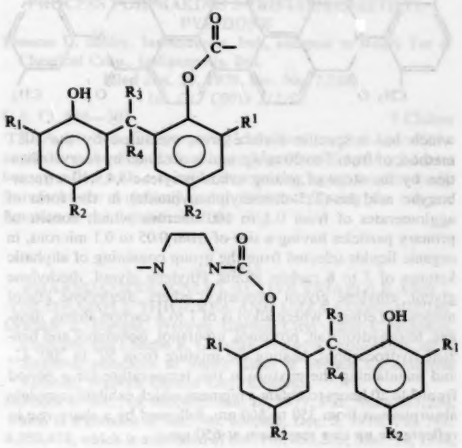
4,230,857

CARBONATES AND URETHANES OF 2,2'-ALKYLENE OR -CYCLOALKYLENE-BIS-4,6-DISUBSTITUTED PHENOLS AS STABILIZERS FOR ORGANIC MATERIALS

William O. Drake, Raritan, N.J.; Hans Hinsken, Lörrach, Fed. Rep. of Germany; Horst Mayerhoefer, Oberwil, and Wolfgang H. Mueller, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 23, 1978, Ser. No. 908,721
Claims priority, application Switzerland, May 23, 1977, 6324/77; May 25, 1977, 6439/77
Int. Cl.² C07D *295/20*; C07C *125/06, 69/96*; C07D *321/12*
U.S. Cl. 544—388 **5 Claims**

1. A compound of the formula,



wherein each

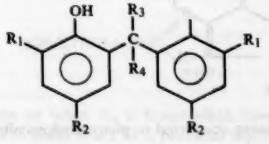
R_1, independently, is (C_{1-8})alkyl, (C_{5-9})cycloalkyl or monomethyl(C_{5-9})cycloalkyl, each

R_2, independently, is (C_{1-8})alkyl, (C_{5-9})cycloalkyl, halo, phenyl or mono (C_{1-9})alkylphenyl, and either each

R_3 is hydrogen, (C_{1-18})alkyl, (C_{5-9})-cycloalkyl or phenyl, and each

R_4 is hydrogen or (C_{1-18})alkyl, or each

unit forms a (C_{5-7}) saturated aliphatic hydrocarbon ring, with the proviso that both groups of the formula



are identical.

4,230,858

PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID DIIMIDE PIGMENT, ITS MANUFACTURE AND ITS USE

Ludwig Gall, Frankenthal, and Wolfgang Fabian, Wilhelmsfeld, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

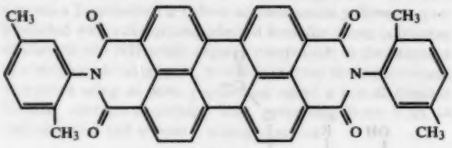
Continuation of Ser. No. 725,852, Sep. 23, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 928,874

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546266

Int. Cl.³ C07D 471/06

U.S. Cl. 546—37 **3 Claims**

1. A perylene-3,4,9,10-tetracarboxylic acid diimide pigment of the formula



which has a specific surface area, measured by the BET method, of from 5 to 20 m^2/g, and is obtained by recrystallization by the steps of mixing crude perylene-3,4,9,10-tetracarboxylic acid bis-(2',5'-dimethylphenylimide) in the form of agglomerates of from 0.1 to 100 microns which consist of primary particles having a size of from 0.05 to 0.1 microns, in organic liquids selected from the group consisting of aliphatic ketones of 3 to 6 carbon atoms, ethylene glycol, diethylene glycol, ethylene glycol monoalkyl ethers, diethylene glycol monoalkyl ethers, where alkyl is of 1 to 4 carbon atoms, dioxane, tetrahydrofuran, propanol, n-butanol, isobutanol and benzene hydrocarbons, heating the mixture from 50° to 200° C., and maintaining the mixture at this temperature for a period from 7 to 20 hours to obtain a pigment which exhibits complete absorption at from 350 to 560 nm, followed by a sharp rise in reflectance up to a maximum at 650 nm.

4,230,859

PROCESS FOR THE PREPARATION OF N-SUBSTITUTED ESTERS OF 9,10-DIHYDROLYSERGIC ACIDS

Rudolf Rucman, Ljubljana, Yugoslavia, assignor to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o., Ljubljana, Yugoslavia

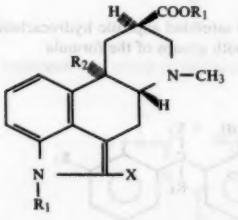
Filed Jul. 7, 1978, Ser. No. 922,692

Claims priority, application Yugoslavia, Jul. 21, 1977, 1819/77

Int. Cl.² C07D 457/04

U.S. Cl. 546—69 **24 Claims**

1. In a process for the preparation of N-substituted esters of 9,10-dihydrolysergic acids of the formula:



(I)

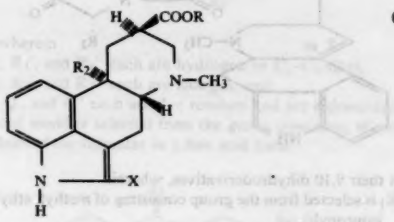
capable of being converted to pharmacologically active compounds wherein

R_1 is an alkyl group of 1–5 carbon atoms, an alkenyl group of 2–5 carbon atoms, or a cycloalkyl group of 3–5 carbon atoms,

R_2 is hydrogen or an alkoxy group of 1–3 carbon atoms, and

X is hydrogen or halogen,

the improvement which comprises carrying out the alkylation of the compounds of the formula:



(II)

wherein

R is hydrogen or a hydrolyzable organic group capable of being hydrolyzed in alkaline medium,

X is hydrogen or halogen, and

R_2 has the meaning as stated above,

with a compound of the formula:

$$R_1Y \qquad \text{(III)}$$

wherein

R_1 has the meaning as stated above,

Y is halogen or sulphate,

in the presence of a catalyst for phase transition of the formula:

$$Z_4QA \qquad \text{(IV)}$$

wherein

Z represents the same or different alkyl, cycloalkyl, aryl, arylalkyl or alkylaryl groups with 1–16 carbon atoms,

Q is an quaternary nitrogen or phosphorus atoms, and

A is an anion,

in a two phase aqueous alkali medium-organic solvent system wherein the organic phase includes a hydrocarbon which is immiscible with water.

4,230,860

PROCESSES FOR THE SEPARATION OF ENANTIOMERS BY SELECTIVE CRYSTALLIZATION

Sivaraman Raghu, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 6, 1978, Ser. No. 958,215

Int. Cl.³ C07D 453/04; C07B 19/00

U.S. Cl. 546—134 **8 Claims**

1. A process for preparing the d-enantiomer of trans-1,2-cyclobutane dicarboxylic acid which consists essentially in the steps of: dissolving racemic trans-1,2-cyclobutane dicarboxylic acid and cinchonidine in an aqueous solvent to form a solution thereof, cooling the latter solution, and recovering thus-formed crystals enriched in d-trans-1,2-cyclobutane dicarboxylic acid.

4,230,861
1-AND/OR 7-SUBSTITUTED-6-HYDROXY (OR OXO)-3-DECAHYDROQUINOLINE CARBOXYLIC ACIDS

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 31,641, Apr. 19, 1979, which is a continuation-in-part of Ser. No. 5,061, Jan. 22, 1979, abandoned. This application Sep. 14, 1979, Ser. No. 75,618

Int. Cl.³ A61K *31/47;* **C07D** *215/14*

U.S. Cl. 546—164 **3 Claims**

1. A compound of the formula

wherein

R is (C_1–C_3)alkyl, allyl or benzyl and;

R^1 is COOZ′ wherein Z′ is (C_1–C_2)alkyl or phenyl-substituted (C_1–C_2)alkyl.

4,230,862
ANTIFERTILITY COMPOUNDS

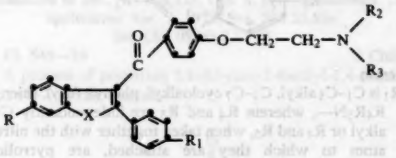
Tulio Suarez, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 761,930, Jan. 24, 1977, abandoned, and a continuation-in-part of Ser. No. 724,202, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,991, Oct. 28, 1975, abandoned. This application Aug. 3, 1978, Ser. No. 930,639

Int. Cl.³ C07D *295/08;* **A01N** *31/40, 31/445, 31/395*

U.S. Cl. 546—237 **23 Claims**

1. A compound of the formula



in which X is —CH_2—CH_2— or —CH=CH—; R is hydrogen, hydroxyl, or C_1–C_5 alkoxy; R_1 is hydrogen, hydroxyl, or C_1–C_5 alkoxy; and R_2 and R_3 taken together with the nitrogen to which they are bonded constitute a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, and hexamethyleneimino; and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,230,863
INSECTICIDAL SULFONIUM SALTS

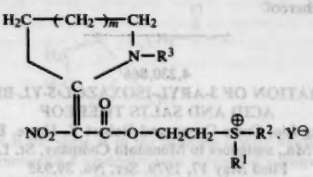
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 2, 1975, Ser. No. 582,575

Int. Cl.³ C07D *211/16, 207/24*

U.S. Cl. 546—246 **3 Claims**

1. A sulfonium salt of the formula:



wherein m is 0 or 1, Y is an anion, R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 10 carbon atoms and R^3 is hydrogen or alkyl of from 1 to 3 carbon atoms.

4,230,864
PROCESS FOR MAKING 5-TRIFLUOROMETHYL PYRIDONE

Thomas D. Bailey, Indianapolis, Ind., assignor to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Jan. 29, 1979, Ser. No. 7,518

Int. Cl.³ C07D *213/04*

U.S. Cl. 546—303 **7 Claims**

1. A process for preparing 5-trifluoromethyl-2-pyridone comprising the step of reacting an amount of 2-hydroxy-5-carboxypyridine with a suitable fluorinating agent to selectively transform the 5-carboxy group without altering the oxygen function in the 2-position of the ring.

4,230,865
PHARMACOLOGICALLY ACTIVE TRIAZOLE AND THIADIAZOLE THIOUREA AND UREA COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

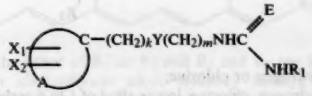
Division of Ser. No. 805,491, Jun. 10, 1977, Pat. No. 4,137,234, which is a division of Ser. No. 638,005, Dec. 5, 1975, Pat. No. 4,053,473, which is a division of Ser. No. 451,333, Mar. 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Sep. 8, 1978, Ser. No. 940,547

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71; Jul. 22, 1971, 34334/71

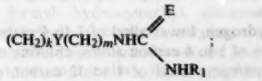
Int. Cl.² A61K *31/41;* **C07D** *285/12*

U.S. Cl. 548—138 **10 Claims**

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a triazole or thiadiazole, ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or sulphur; and R_1 is hydrogen, lower alkyl, benzoyl or di-lower

alkylamino-lower alkyl or a pharmaceutically acceptable addition salt thereof.

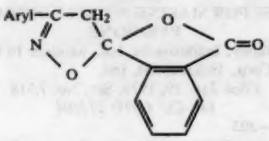
4,230,866

PREPARATION OF 3-ARYL-ISOXAZOL-5-YL-BENZOIC ACID AND SALTS THEREOF

Kou-Chang Liu, Creve Coeur, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 17, 1979, Ser. No. 39,935
Int. Cl.[3] C07D 261/08
U.S. Cl. 548—247 9 Claims

1. A process for preparing a salt of 3-Aryl-isoxazol-5-yl-benzoic acid which comprises reacting a spiro compound having the formula



with a base having a pK_A of 11 or more, in the presence of a water-miscible solvent.

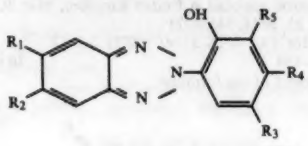
4,230,867

PROCESS FOR THE PRODUCTION OF 2-ARYL-2H-BENZOTRIAZOLES

Siegfried Kintopf, and Ulrich Kress, both of Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 668,344, Mar. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 577,385, May 14, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 855,040
Int. Cl.[3] C07D 249/20
U.S. Cl. 548—260 21 Claims

1. A process for the production of 2-aryl-2H-benzotriazoles of the formula I



(I)

wherein

R_1 is hydrogen or chlorine,

R_2 is hydrogen, chlorine, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, carboxy or $—SO_3H$,

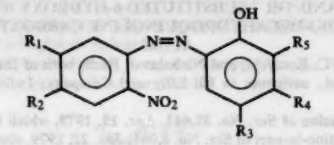
R_3 is alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenyl substituted with alkyl groups, said alkyl groups having 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, chlorine, carboxyethyl or phenylalkyl of 7 to 9 carbon atoms,

R_4 is hydrogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, chlorine or hydroxyl, and

R_5 is hydrogen, alkyl of 1 to 12 carbon atoms, chlorine, cycloalkyl of 5 to 6 carbon atoms or phenylalkyl of 7 to 9 carbon atoms,

which comprises

reducing and cyclizing the corresponding o-nitroazobenzene



with hydrogen at a temperature in the range of from about 20° C. to about 100° C. and at a pressure in the range of from about 15 psia (1.05 kg/cm^2, 1 atmosphere) to about 1000 psia (70 kg/cm^2, 66 atmospheres) while mixed in an alkaline organic solvent mixture comprising an organic amine in a concentration of at least 0.1 mole of amine per mole of o-nitroazobenzene in the presence of hydrogenation catalyst selected from the group consisting of the noble metals of Group VIII of the Periodic Table with the proviso that the hydrogenation catalyst cannot be palladium-on-asbestos, and with the proviso that, when R_1, R_2, R_3, R_4 or R_5 is chlorine, the hydrogenation catalyst cannot be palladium,

separating the catalyst which is suitable for recycle, and recovering the desired 2-aryl-2H-benzotriazole.

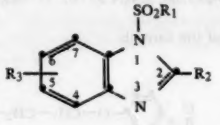
4,230,868

α-ALKYL-α-HYDROXYBENZYL-SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 883,113, Mar. 3, 1978, which is a division of Ser. No. 750,991, Dec. 15, 1976, Pat. No. 4,118,742, which is a continuation of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Apr. 17, 1979, Ser. No. 30,782
Int. Cl.[2] C07D 235/30, 413/12, 401/12, 403/12
U.S. Cl. 548—306 14 Claims

1. A compound of the formula



(I)

wherein

R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl or R_4R_5N—, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5, when taken together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_3 is α-C_1-C_7 alkyl-α-hydroxybenzyl and R_3 is at the 5 or 6 position.

4,230,869

PROCESS FOR PREPARING 5-(4-HYDROXYPHENYL)HYDANTOIN

Koji Yoneda, Amagasaki; Takehisa Ohashi; Tomoaki Nagamachi, both of Kobe; Hirotaka Fukumitsu, Kakogawa, and Satomi Takahashi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1978, Ser. No. 887,132
Claims priority, application Japan, Mar. 18, 1977, 52-30824; Feb. 25, 1978, 53-21305
Int. Cl.[3] C07D 233/78
U.S. Cl. 548—314 5 Claims

1. A process for preparing 5-(4-hydroxyphenyl)hydantoin which comprises subjecting glyoxylic acid, urea and phenol to

reaction in an aqueous medium at a temperature of not less than 40° C. in the presence of a strong mineral acid, the concentration of which in the reaction system is not less than 2 N.

4,230,870

NOVEL PHOTOGRAPHIC COLOR COUPLERS

Hector A. Vanden Eynde, Edegem, and Raphaël K. Van Poucke, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

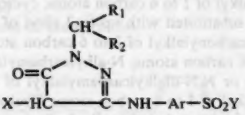
Division of Ser. No. 452,326, Mar. 18, 1974, Pat. No. 3,947,272. This application Mar. 29, 1976, Ser. No. 671,382

Claims priority, application United Kingdom, Apr. 6, 1973, 16627/73

Int. Cl.³ C07D *231/00*

U.S. Cl. 548—360 **6 Claims**

1. A colour coupler corresponding to the general formula:



wherein:

R_1 represents hydrogen, alkyl or aryl,

R_2 represents a fluoroalkyl group $X(CF_2)_n$— wherein X is hydrogen or fluorine and n is 1 to 10, an α-cyanoalkyl group, or a phenyl group,

X represents hydrogen or a substituent that exhibits 2-equivalent character,

Ar represents a phenylene group, and

Y represents an alkyl group, an aryl group, a monoalkylamino group, a monoarylamino group, a dialkylamino group or an alkylarylamino group.

4,230,871

PROCESS FOR PREPARING 5,6-DIHYDRO-2-METHYL-1,4-OXATHIIN DERIVATIVES

Wha S. Lee, c/o 678 Portage St., Ottawa, Canada (K1G 1T4)

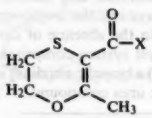
Continuation of Ser. No. 839,129, Oct. 3, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,834

Int. Cl.³ C07D *327/06*

U.S. Cl. 549—14 **3 Claims**

1. A process of preparing 5,6-dihydro-2-methyl-1,4-oxathiin derivative I of the formula

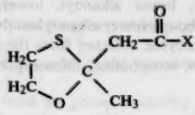
I



wherein X is an amino group having the formula,

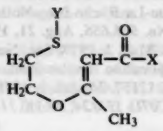
wherein R and R' are the same or different and are selected from the group consisting of hydrogen, phenyl, alkyl having up to 15 carbon atoms, cyclohexyl, nitrophenyl, alkoxyphenyl in which the alkoxy group has up to 4 carbon atoms, benzyl, furfuryl, halophenyl, tolyl, naphthyl, biphenyl, or X is an alkoxy group—OR, in which R is primary, secondary or tertiary alkyl group having up to 6 carbon atoms; comprising treating the 1,3-oxathiolane IV of the formula:

IV



wherein X is the same as in the formula I, with halogen (chlorine or bromine) in a nonhydroxylic solvent at a temperature in the range between −60° C. and room temperature whereby ring expansion takes place via a sulfenyl compound of the formula

V



wherein Y is Cl or Br which cyclizes with loss of hydrogen halide to form the compound I, and subsequently isolating this from the resulting mixture.

4,230,872

POLYENE COMPOUNDS

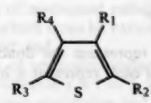
Michael J. Klaus, Weil am Rhein, Fed. Rep. of Germany, and Beverly A. Pawson, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 801,688, May 31, 1977, Pat. No. 4,116,975, which is a division of Ser. No. 733,507, Oct. 18, 1976, Pat. No. 4,061,656, which is a continuation-in-part of Ser. No. 632,029, Nov. 14, 1975, abandoned. This application May 11, 1978, Ser. No. 904,950

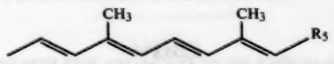
Int. Cl.³ C07D *333/24, 333/26, 333/28, 333/30*

U.S. Cl. 549—62 **19 Claims**

1. A compound represented by the formula



wherein one of R_1 or R_2 is



and the other of R_1 or R_2 and R_3 and R_4 are hydrogen, lower alkoxy-lower alkyl, hydroxy methyl, halogen, lower alkyl, lower alkoxy, amino, carboxyl, mono(lower alkyl)amino, lower alkyl thio, di(lower alkyl)amino, mono(lower alkyl)amino lower alkyl, di(lower alkyl-)amino lower alkyl, hydroxy, lower alkenyl, lower alkenoxy, lower alkanoyl, lower alkanoyloxy, nitro, lower alkoxycarbonyl, lower alkanoylamido or a nitrogen containing heterocycle, selected from the group consisting of piperidino, morpholino, thiomorpholino and pyrrolidino and R_5 is formyl, hydroxymethyl, alkoxymethyl, alkanoyloxymethyl, alkoxycarbonyl, aroyloxymethyl or an N-heterocyclylcarbonyl selected from the group consisting of piperidino, morpholino, thiomorpholino and pyrrolidino; with the proviso that when R_5 is alkoxycarbonyl, at least one of R_1, R_2, R_3 and R_4 is lower alkoxy-lower alkyl, hydroxy methyl, halogen, lower alkoxy, amino, carboxyl, mono(lower alkyl)amino, lower alkyl thio, di(-lower alkyl)amino, mono(lower alkyl)amino lower alkyl,

di(lower alkyl)amino lower alkyl, hydroxy, lower alkenyl, lower alkenoxy, lower alkanoyl, lower alkanoyloxy, lower alkoxycarbonyl, lower alkanoylamido or a nitrogen containing heterocycle, selected from the group consisting of piperidino, morpholino, thiomorpholino and pyrrolidino.

4,230,873

THIOPHENE DERIVATIVES

Otto Hromatka, and Dieter Binder, both of Vienna, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 606,656, Aug. 21, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,716

Claims priority, application Switzerland, Aug. 26, 1974, 11582/74; Sep. 9, 1974, 12157/74; Jul. 9, 1975, 8963/75

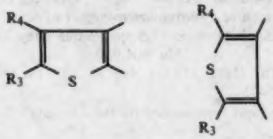
Int. Cl.[3] **C07D** *333/24;* **A61K** *31/38*

U.S. Cl. 549—64 **3 Claims**

1. Sulphothiophene-carboxylic acids of the general formulae

I

Wherein A together with the two carbon atoms to which it is attached forms the group



(a) (b)

and the broken line represents the double bond present in group (a), R_3 and R_4 each represent a hydrogen atom or a lower alkyl group.

4,230,874

N-(BENZENESULFONYL) CARBAMATES-HERBICIDAL ANTIDOTES

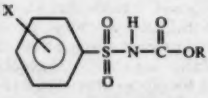
Ferenc M. Pallos, Walnut Creek, and Edmund J. Gaughan, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 619,114, Oct. 2, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 721,721

Int. Cl.[3] **C07C** *147/13*

U.S. Cl. 560—12 **3 Claims**

1. Compounds according to the formula



in which X is trifluoromethyl and R is haloalkyl having 2 to 6 carbon atoms, inclusive, and wherein halo is chloro or fluoro from 1 to 6, inclusive.

4,230,875

FUNGICIDAL, MITICIDAL AND OVICIDAL ALKOXYCARBONYLALKYL-SUBSTITUTED AND CARBAMYLALKYL-SUBSTITUTED N-HALOALKYLTHIOSULFONAMIDES

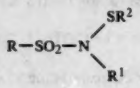
David C. K. Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 734,858, Oct. 22, 1976, Pat. No. 4,112,237. This application Jul. 3, 1978, Ser. No. 921,385

Int. Cl.[2] **C07C** *145/02*

U.S. Cl. 560—12 **12 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 6 carbon atoms; cycloalkyl of 5 to 8 carbon atoms substituted with up to 2 alkyl of 1 to 4 carbon atoms; alkoxycarbonylalkyl of 2 to 6 carbon atoms; carbamylalkyl of 1 to 6 carbon atoms; N-alkylcarbamylalkyl of 2 to 6 carbon atoms; or N,N-dialkylcarbamylalkyl of 3 to 6 carbon atoms; R^1 is alkyl of 1 to 6 carbon atoms; cycloalkyl of 5 to 8 carbon atoms substituted with up to 2 alkyl or 1 to 4 carbon atoms; phenyl substituted with up to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, trifluoromethyl, trichloromethyl, tribromoethyl, or alkyl of 1 to 4 carbon atoms; alkoxycarbonylalkyl of 2 to 6 carbon atoms, carbamylalkyl of 1 to 6 carbon atoms; N-alkylcarbamylalkyl of 2 to 6 carbon atoms; or N,N-dialkylcarbamylalkyl of 3 to 6 carbon atoms; and R^2 is alkyl of 1 to 2 carbon atoms and of 1 to 5 fluoro, chloro, bromo or iodo atoms, with the proviso that one R or R^1 group is alkoxycarbonylalkyl, carbamylalkyl of 1 to 6 carbon atoms, N-alkylcarbamylalkyl of 2 to 6 carbon atoms or N,N-dialkylcarbamylalkyl of 3 to 6 carbon atoms.

4,230,876

PROCESS FOR THE PREPARATION OF URETHANES

Hans-Joachim Scholl, Cologne, and Armin Zenner, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,638

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808990

Int. Cl.[3] **C07C** *125/07*

U.S. Cl. 560—25 **6 Claims**

1. In a process for the preparation of urethanes by the reaction of aromatic nitro compounds with aliphatic, cycloaliphatic or araliphatic alcohols and carbon monoxide in the presence of a catalyst system, the improvement wherein said reaction is conducted in the absence of carboxylic acids and phenols and said catalyst system comprises (1) selenium or a selenium compound; (2) a bicyclic amidine; and (3) an aromatic amino and/or aromatic urea compound.

4,230,877

METHOD FOR INCREASING THE 4,4'DICARBAMATE ISOMER OF THE DIPHENYLMETHANE DICARBAMATES DURING PREPARATION THEREOF

Edward T. Shawl, Wallingford, and Gerald A. Bullano, Glen Mills, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 22, 1979, Ser. No. 22,749

Int. Cl.[2] **C07C** *125/04*

U.S. Cl. 560—25 **13 Claims**

1. A method for the preparation of diphenylmethane dicarbamates and polymethylene polyphenyl carbamates having an increased amount of 4,4'-diphenylmethane dicarbamate isomer in the total diphenylmethane dicarbamate produced which comprises reactng in a single phase system an N-aryl carbamic

acid ester with a carbonyl compound selected from formaldehyde, para-formaldehyde or trioxane or mixtures thereof, at a temperature of from about ambient to about 170° C. in the presence of a mineral acid condensation catalyst while said N-aryl carbamic acid ester is dissolved in an inert organic solvent having a dielectric constant of at least 20 at 20° C. and at a concentration of N-aryl carbamic acid ester in said solvent of from 0.1 to 50 weight percent and recovering the desired carbamates.

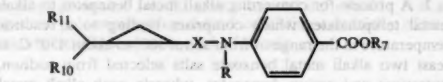
4,230,878

HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC 4-[(CYCLOPROPYL ALKYL)AMINO]BENZOIC ACIDS AND DERIVATIVES

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 8, 1978, Ser. No. 884,673
Int. Cl.³ C07C *101/62, 101/60*
U.S. Cl. 560—48 **6 Claims**

1. A compound of the formula:



wherein R_7 is hydrogen, or a loweralkyl group; R_{11} is hydrogen or a C_1 to C_{15} alkyl group unsubstituted or substituted with at least one methyl group; R_{10} is hydrogen methyl; X is a bond or a C_1 to C_{15} branched or unbranched alkylene group unsubstituted or substituted with at least one methyl group; and R is selected from the group consisting of hydrogen or methyl and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

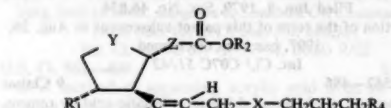
4,230,879

15-DEOXY-16-HYDROXY-16-FORMYO OR DIMETHOXY-METHYL-PROSTANE DERIVATIVES OF THE E AND F SERIES

Allen Wissner, Westchester, and Charles V. Grudzinskas, Nyack, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,513
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—121 **18 Claims**

1. An optically active compound of the structure:



wherein

X is

Y is

R_1 is selected from the group consisting of hydrogen and hydroxyl;

R_2 is selected from the group consisting of hydrogen and C_1–C_6 alkyl;

R_3 is selected from the group consisting of formyl and dimethoxymethyl;

R_4 is selected from the group consisting of hydrogen and C_1–C_3 alkyl;

Z is selected from the group consisting of a divalent moiety of the formula $—(CH_2)_n—$, $—(CH_2)_mOCH_2—$ and $—(CH_2)_mSCH_2—$ wherein n is 5 to 7, and m is 3 to 5; the racemic mixture thereof, and when R_2 is hydrogen, the pharmaceutically acceptable sale thereof.

4,230,880

2,5-DIKETOGLUCONIC ACID ESTERS

Glenn C. Andrews, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 843,946, Oct. 20, 1977, Pat. No. 4,159,990, which is a continuation-in-part of Ser. No. 749,509, Dec. 10, 1976, abandoned. This application Feb. 16, 1979, Ser. No. 12,683
Int. Cl.³ C07C *69/675*
U.S. Cl. 560—174 **3 Claims**

1. A normal-alkyl ester of 2,5-diketogluconic acid wherein said alkyl group is of 1 to 4 carbon atoms.

4,230,881

PREPARING OXALIC ACID ESTERS

Ugo Romano, Milan, and Franco Rivetti, Schio, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Apr. 6, 1978, Ser. No. 894,139
Claims priority, application Italy, Apr. 7, 1977, 22209 A/77
Int. Cl.³ C07C *67/36, 69/36*
U.S. Cl. 560—193 **14 Claims**

1. The method of preparing an ester of oxalic acid from carbon monoxide and an alcohol, wherein the reaction is carried out in the presence of a catalyst consisting of a complex of palladium selected from the group consisting of:

(a) the complexes of bivalent palladium of the formula LL'PdXX' or L"PdXX' in which L and L' are monodentate neutral ligands, L" is a chelating neutral ligand, X and X', the same or different, are anionic ligands;

(b) the complexes of zerovalent palladium having the formula PdL'''_n in which n can be varied from 2 to 4, and L''' is a neutral ligand; and

(c) the complexes of zerovalent palladium of the formula $Pd_x(CO)_yL^{IV}_z$ wherein x is 1 or 3, y is 1 or 3, z is 3 or 4 and L^{IV} is a tertiary phosphine; and

a co-catalyst consisting of a compound having acidic properties selected from the group consisting of amine salts, carboxylic acids, phenol, succinimide and phthalimide.

4,230,882

PROCESS FOR THE PRODUCTION OF A HIGH PURITY TEREPHTHALIC ACID

Maomi Seko; Tetsuya Miyake, both of Tokyo; Hiroshi Takeuchi, and Masatoshi Tanouchi, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1978, Ser. No. 907,773
Int. Cl.² C07C *51/33*
U.S. Cl. 562—416 **18 Claims**

1. In a process for the production of a high purity terephthalic acid by a liquid phase oxidation reaction of para-xylene by means of molecular oxygen or a molecular oxygen-containing gas in an aliphatic monocarboxylic acid solvent in the presence of a cobalt-manganese-bromine catalyst system, the improvement wherein in the liquid phase oxidation reaction, there are used acetaldehyde in an amount of 0.05 to 0.60 mole per mole of para-xylene and as the cobalt-manganese-bromine catalyst system (A) at least one cobalt compound selected from the group consisting of cobalt acetate, cobalt propionate, cobalt butyrate, cobalt naphthenate, cobalt carbonate, cobalt benzoate, cobalt bromoacetate, cobalt bromide and hydrates

thereof, (B) at least one manganese compound selected from the group consisting of manganese acetate, manganese propionate, manganese butyrate, manganese naphthenate, manganese carbonate, manganese benzoate, manganese bromoacetate, manganese bromide and hydrates thereof and (C) at least one bromine compound selected from the group consisting of hydrogen bromide, cobalt bromide and hydrates thereof, manganese bromide and hydrates thereof, bromoacetic acid, cobalt bromoacetate and a hydrate thereof, manganese bromoacetate and a hydrate thereof, aralkyl bromides and alkane bromides, in amount such as will provide a cobalt atom concentration of 0.01 to 0.05% by weight based on the aliphatic monocarboxylic acid solvent, a manganese atom concentration of 35 to 100% by weight based on the cobalt atom and a bromine atom concentration of 0.10 to 0.40% by weight based on the aliphatic monocarboxylic acid solvent, and the liquid phase oxidation reaction is effected at a temperature of 170° to 190° C. under an elevated pressure while maintaining the water concentration in the reaction system at a level of 3 to 9% by weight based on the aliphatic monocarboxylic acid, followed by separation and recovery of terephthalic acid crystals from the reaction mixture.

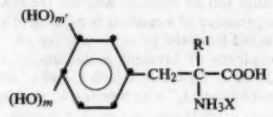
4,230,883

PREPARATION OF HYDROXYPHENYLALANINE HYDROHALIDE SALTS

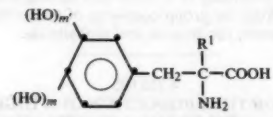
David D. Saperstein, Mountainside, and Seemon H. Pines, Murray Hill, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 12, 1977, Ser. No. 859,415
Int. Cl.[2] C07C *99/00, 101/72*
U.S. Cl. 562—445 **7 Claims**

1. A process for preparing a 1:1 microcrystalline salt product of the formula:



wherein
m and m' are independently zero or one but not both zero,
X is chloro or bromo, and
R^1 is H or alkyl of one through four carbons which comprises reacting amino acid the formula:



with liquid HBr or HCl, the reactants being substantially free of water and other polar solvents, such that said product consists essentially of equimolar amounts of said amino acid and HBr or HCl, substantially free of impurities.

4,230,884

PROCESS FOR PREPARING 2-(3-BENZOYLPHENYL)-PROPIONIC ACID

Boris Zupančič and Mirko Sopčič, both of Ljubljana, Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o., Ljubljana, Yugoslavia

Filed Apr. 10, 1979, Ser. No. 28,779
Claims priority, application Yugoslavia, Apr. 10, 1978, 853/78
Int. Cl.[3] C07C *59/84*
U.S. Cl. 562—460 **5 Claims**

1. Process for preparing 2-(3-benzoylphenyl)-propionic acid or salt thereof wherein 3-benzoylphenyl acetonitrile or an alkoxide thereof comprising 1 to 4 carbon atoms in the alkoxy moiety are reacted with a methylating agent in a two-phase system under conditions of phase transfer catalysis, whereupon the mixture is hydrolysed and optionally the obtained acid is converted into a metal salt or an addition salt of a nitrogen-containing base, characterized in that the methylation is performed in the presence of neutral non-cyclic ligands with an open polyether chain as a catalyst at a temperature within the range of −10° to +50° C.

4,230,885

CONVERSION OF AROMATIC CARBOXYLATES TO TEREPHTHALATE

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 12, 1978, Ser. No. 914,835
Int. Cl.[3] C07C *51/347, 51/353*
U.S. Cl. 562—481 **2 Claims**

1. A process for converting alkali metal benzoates to alkali metal terephthalates which comprises heating to a reaction temperature in the range of from about 380° to about 430° C. at least two alkali metal benzoate salts selected from sodium, potassium and cesium benzoates, wherein each alkali metal benzoate is present in an amount equal to at least two weight percent of the total alkali metal benzoate present, in the presence of a catalyst selected from the benzoate salts of zinc, zinc and cadmium, zinc and silver, and zinc and iron, wherein when two salts are combined to form the catalyst each component of the catalyst will be present in amounts greater than about 10 mole percent of total catalyst, and wherein when the catalyst is zinc benzoate the alkali metal benzoates present are sodium, potassium, and cesium.

4,230,886

METHOD OF OBTAINING DRIED TEREPHTHALIC ACID

Fujio Tsuchiya; Kenzo Yamamoto; Katsunobu Yamaguchi, and Akio Okagami, all of Yokohama, Japan, assignors to JGC Corporation, Tokyo and Orient Kagaku Kogyo K.K., Osaka, both of, Japan

Filed Jun. 8, 1979, Ser. No. 46,824
The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.
Int. Cl.[3] C07C *51/42*
U.S. Cl. 562—486 **9 Claims**

1. A method of obtaining dried terephthalic acid by removing acetic acid and/or water from a slurry containing terephthalic acid and acetic acid and/or water, characterized by feeding the slurry to a tubular type heater having at least one heating tube which opens at one end in a separation chamber to change the slurry to a solid-gas mixture in the heating tube, discharging the mixture into the separation chamber to separate the solid component and the gas component, thus obtaining terephthalic acid in the form of dried powder; and terephthalic acid content in the slurry being less than the value "C" defined by the formula:

$$C=(2.5\theta^{0.4}+66)\alpha+(3.2\theta^{0.35}+74)(1-\alpha)$$

wherein C is expressed as % by weight, θ is temperature (°C.) of the heating tube, θ is molar ratio of water in the slurry medium and $(1-\alpha)$ is molar ratio of acetic acid in the slurry medium.

4,230,887
RECOVERY OF ANHYDROUS ACIDS

William T. Mitchell, Corpus Christi, and Phillip S. Snyder, Houston, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,196
Int. Cl.[2] C07C *51/42, 51/44, 51/48, 53/08, 53/22, 55/02, 57/04, 57/14*
U.S. Cl. 562—593 20 Claims

1. A process for recovering a C_2–C_6 carboxylic acid from a gaseous mixture comprising said carboxylic acid and water, said carboxylic acid being a monocarboxylic acid or a dicarboxylic acid and being composed only of carbon, hydrogen and oxygen, said process comprising: (a) in a gas absorption zone, intimately contacting said gaseous mixture, while maintained in the vapor phase, with a solvent which is maintained in the liquid phase whereby C_2–C_6 carboxylic acid is absorbed from said gaseous mixture into said solvent, said solvent comprising a polymer of the formula:

$$R_1—O—(X)—R_2 \quad \text{I}$$

wherein R_1 and R_2 may be alike or different and are hydrogen or alkyl groups of 1 to 20 carbon atoms, and wherein X is a divalent polyoxyalkylene radical consisting essentially of repeating oxyalkylene units of the formula:

$$—(CH_2—\underset{\displaystyle R_3}{\underset{|}{CH}}—O)— \quad \text{II}$$

wherein R_3 is hydrogen or a lower alkyl radical of from 1 to 6 carbon atoms and wherein R_3 may be alike or different on the repeating oxyalkylene units, said polymer having a molecular weight within the range of about 250 to 5,000, the intimate contact of said gaseous mixture and said solvent being accomplished at a temperature which is below the boiling point of said solvent at the pressure involved and which is above the dew point of said gaseous mixture at the pressure involved so as to prevent condensation of the water from said gaseous mixture; and, (b) removing from said gas absorption zone a liquid, acid enriched solvent fraction consisting essentially of said solvent having C_2–C_6 carboxylic acid absorbed therein, and recovering C_2–C_6 carboxylic acid from said solvent fraction.

4,230,888
PROCESS FOR PURIFICATION OF ACRYLIC ACID BY FRACTIONAL CRYSTALLIZATION

Stephen C. Paspek, Cleveland, and William A. Every, Twinsburg, both of Ohio, assignors to Standard Oil Company (Ohio)

Filed Dec. 15, 1977, Ser. No. 860,937
Int. Cl.[2] C07C *51/42, 57/04*; B01D *9/02*
U.S. Cl. 562—600 12 Claims

1. A method of separating acrylic acid from an aqueous solution containing acrylic acid comprising adding a salt that eliminates the eutectic point between acrylic acid and water to the aqueous solution in an amount sufficient to saturate said aqueous solution, and fractionally crystallizing said aqueous solution to obtain acrylic acid.

4,230,889
DESENSITIZED SOLUTION OF DIHYDROPEROXYCYCLOHEXANE

Hendrik Hansma, Schalkhaar, and Arnold Schroeder, Deventer, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 30, 1978, Ser. No. 922,145
Claims priority, application Netherlands, Jul. 4, 1977, 7707356
Int. Cl.[3] C07C *179/053*
U.S. Cl. 568—559 9 Claims

1. A stable composition containing a cyclohexanone peroxide and a solvent, characterized in that the peroxide contained in the composition is a cyclohexanone peroxide consisting essentially of 1,1-dihydroperoxycyclohexane and the solvent contained in it is water; a mono- or polyhydric alcohol; an alcohol ether; an ester derived from an aliphatic or aromatic monocarboxylic acid or polycarboxylic acid and a monohydric or polyhydric alcohol; a ketoalcohol or a ketoether.

4. A method for desensitizing solid 1,1-dihydroperoxycyclohexane which comprises dissolving it in water, an alcohol, an ester or keotoether.

4,230,890
METHOD OF RECOVERING DIALKYLBENZENE DIHYDROPEROXIDE

Ward J. Burkholder, Baton Rouge, La., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 34,634, May 4, 1970, abandoned. This application Jul. 19, 1978, Ser. No. 926,139
Int. Cl.[3] C07G *179/035*
U.S. Cl. 568—576 16 Claims

1. A method for recovering dialkylbenzene dihydroperoxide from an oxidation reaction product containing dialkylbenzene dihydroperoxide, dialkylbenzene monohydroperoxide, and unreacted dialkylbenzene, comprising the steps:

(a) mixing said oxidation reaction product with an amount of water immiscible organic solvent in a volume ratio of organic solvent to reaction product of about 0.1/1 to about 6/1, said organic solvent being of a type which is substantially non-reactive, under the processing conditions, with said reaction product or alkali metal hydroxide and in which alkali metal salts of diakylbenzene dihydroperoxides are substantially insoluble;

(b) treating, at a temperature maintained below about 130° C., the oxidation reaction product-solvent mixture with alkali metal hydroxide in a molar ratio of hydroxide to dihydroperoxide of about 0.5/1 to about 5/1 to precipitate the alkali metal salt of the dialkylbenzene dihydroperoxide from said solution,

(c) separating the solid alkali metal salt of the dihydroperoxide from the solution, and

(d) converting the dihydroperoxide salt to dialkylbenzene dihydroperoxide.

8. A method for recovering diisopropylbenzene dihydroperoxide from an oxidation reaction product which contains said diisopropylbenzene dihydroperoxide, diisopropylbenzene monohydroperoxide in an amount of about 2 to 3 times the amount of said diisopropylbenzene dihydroperoxide, (2-hydroperoxy-2-propyl) phenyl dimethyl carbinol, and unreacted diisopropylbenzene, comprising the steps:

(a) mixing said oxidation reaction product with a water immiscible organic solvent in a volume ratio of solvent to oxidation reaction product of between about 0.1/1 to about 6/1 to form a reaction product-solvent mixture, said organic solvent being of a type which is substantially non-reactive, under the processing conditions, with said reaction product or alkali metal hydroxide and in which alkali metal salts of dialkylbenzene dihydroperoxides are substantially insoluble,

(b) treating, at a temperature maintained below about 130° C., the oxidate-solvent solution with alkali metal hydroxide in a molar ratio of alkali metal hydroxide to diisopropylbenzene dihydroperoxide of between about 0.5/1 to 5/1 to precipitate the alkali metal salt of said diisopropylbenzene dihydroperoxide from said solution,

(c) recovering said precipitated solid alkali metal salt of said diisopropylbenzene dihydroperoxide substantially free of diisopropylbenzene monohydroperoxide and (2-hydroperoxy-2-propyl) phenyl dimethyl carbinol,

(d) redissolving said alkali metal salt in an aqueous solution, and

(e) recovering diisopropylbenzene dihydroperoxide from said aqueous alkali metal salt solution.

4,230,891

2-(2,2-DIHALOVINYL)-3,3-DIMETHYLCYCLOPROPANECARBALDEHYDE DIMETHYL ACETAL

Pieter A. Verbrugge; Petrus A. Kramer; Johannes Van Berkel, and Hendrik C. Kelderman, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

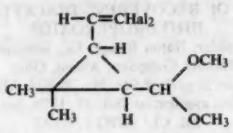
Filed Dec. 5, 1978, Ser. No. 966,681

Claims priority, application United Kingdom, Dec. 16, 1977, 52466/77

Int. Cl.³ C07C *43/313*

U.S. Cl. 568—591 **3 Claims**

1. A compound of the formula I



wherein each Hal independently is selected from chlorine, bromine or fluorine.

4,230,892

ALCOHOLYSIS PROCESS FOR PREPARING POLY-(TETRAMETHYLENE ETHER) GLYCOL

Gerfried Pruckmayr, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 905,972, May 15, 1978, abandoned, and a continuation-in-part of Ser. No. 767,510, Feb. 14, 1977, abandoned, and a continuation-in-part of Ser. No. 672,557, Mar. 31, 1976, abandoned. This application Jul. 20, 1979, Ser. No. 59,137

Int. Cl.³ C07C *43/11*

U.S. Cl. 568—617 **7 Claims**

1. A process for converting a poly(tetramethylene ether) diester to PTMEG, the process comprising

(A) preparing a mixture of

(1) a poly(tetramethylene ether) diester having a pH of about 7,

(2) an alkanol of 1–4 carbon atoms, and

(3) 1–25 mol percent, based on the diester, of a catalyst which is an oxide or hydroxide of calcium, strontium or barium;

(B) bringing the mixture to its boiling point and holding it there while the vapors of the alkanol/alkyl ester azeotrope which form are continuously removed from the reaction zone, until conversion is substantially complete; and then

(C) removing the catalyst, and optionally the residual alkanol and residual alkyl ester, from the reaction mass.

4,230,893

1,1-DI(4-HYDROXY-3-METHOXYPHENYL)-2-ALKOXYPROPANE

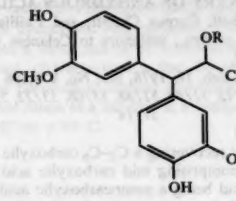
George Gal, Watchung, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 13, 1979, Ser. No. 75,345

Int. Cl.³ C07C *43/20, 101/77*

U.S. Cl. 568—640 **3 Claims**

1. A compound of structural formula:



wherein R is C_{1-5} alkyl.

4,230,894

METHOD FOR PRODUCING 3-ALKYLPHENOLS AND 1,3-HYDROXYBENZENE

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,627

Int. Cl.³ C07C *37/08, 179/047, 15/085*

U.S. Cl. 568—768 **13 Claims**

1. In the process for the production of hydroxybenzene compounds having substituents in the 1 and 3 positions on the benzene ring, said process comprising: (A) alkylation of an aromatic compound with an alkylating agent "comprising an unsaturated hydrocarbon or a compound capable of generating an unsaturated hydrocarbon" to produce an isomeric mixture of dialkylbenzene compounds; (B) separation of the isomers of said dialkylbenzene compounds to obtain a material enriched with respect to the 1,3-dialkylbenzene isomer; (C) oxidation of said material enriched with respect to said 1,3-dialkylbenzene isomer with oxygen to yield the hydroperoxide thereof; and (D) acid catalyzed rearrangement of said hydroperoxide to yield a 1,3-disubstituted benzene compound having at least one hydroxyl substituent thereon; the improvement comprising: in separation step (B) contacting said isomeric mixture of dialkylbenzene compounds with a shape selective zeolite catalyst, at a temperature of between about 150° C. and about 800° C. and a pressure of between about 10^4 N/m^2 and about 10^7 N/m^2, to selectively react the 1,4-dialkyl isomer of said dialkylbenzene compounds, the reaction mixture thereby becoming enriched with respect to the 1,3-dialkyl isomer thereof, said shape selective zeolite catalyst being characterized by a constraint index within the range of from about 1 to about 12 and further by a silica to alumina ratio of at least 12.

4,230,895

THERMAL HYDRODEALKYLATION OF ALKYL PHENOLS

Francis P. Daly, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Nov. 30, 1978, Ser. No. 964,813

Int. Cl.³ C07C *37/50*

U.S. Cl. 568—805 **11 Claims**

1. A process for thermal dealkylation of alkylated phenols to form a phenol product comprising mixing a feed solution comprising at least one alkylated phenol with hydrogen and reacting the mixture in the presence of added water vapor at a temperature of from about 1000° to about 1500° F., the amount of water vapor used ranging from about 10 to about 40% by weight, based on the total weight of the feed solution.

4,230,896

CATALYTIC STEAM DEALKYLATION OF ALKYL PHENOLS

Francis P. Daly, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Nov. 30, 1978, Ser. No. 964,814
Int. Cl.[3] C07C *37/50*
U.S. Cl. 568—805 11 Claims

1. A process of dealkylating alkyl phenol to form a phenol product comprising reacting a feed solution comprising a mixture of alkyl phenols with steam in the presence of a catalyst, the catalyst comprising a hydrous carrier, from about 0.1 to about 10% by weight of at least one catalyst deactivation suppressor selected from the group consisting of Group I-A and Group II-A metals, and from about 0.1 to about 20% by weight of at least one promoter selected from the group consisting of Group VIII metals and Group VI-B metal oxides, the mole ratio of steam to alkyl phenols being from about 1:1 to about 15:1, the reaction being carried out at a temperature of from about 250° to about 700° C. and at a pressure of from about 1 to about 50 atmospheres, the weight hourly space velocity of the alkyl phenols is from about 0.1 to about 5.0 gm phenol/hr/gram catalyst.

4,230,897

PROCESS FOR SELECTIVELY HYDROGENATING A HYDROCARBON CUT CONTAINING AT LEAST ONE DIOLEFINIC HYDROCARBON AND AT LEAST ONE ACETYLENIC HYDROCARBON USING A PALLADIUM CATALYST WITH CRYSTALLITES OF AT LEAST 50 ANGSTROMS

Jean Cosyns, Maule; Robert Stern, Paris, and Jean-Francois Le Page, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1979, Ser. No. 26,984
Claims priority, application France, May 5, 1978, 78 10490
Int. Cl.[3] C07C *5/08, 7/00*
U.S. Cl. 585—260 16 Claims

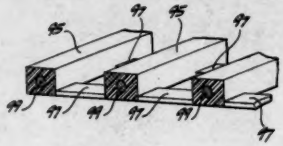
1. In a process for selectively hydrogenating a hydrocarbon fraction containing simultaneously at least one diolefinic hydrocarbon and at least one acetylenic hydrocarbon, including the hydrogenation of the acetylenic hydrocarbon but without substantial hydrogenation of the diolefinic hydrocarbon, wherein said fraction, at least partially in the liquid phase, and hydrogen are contacted with a catalyst of palladium on alumina, the improvement wherein the average size of the palladium crystallites in said catalyst is of at least 50 Angströms, whereby the selective hydrogenating activity of the catalyst is substantially prolonged.

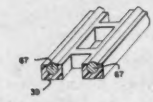
4,230,898

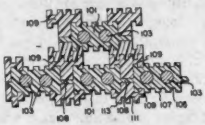
ELONGATED FILAMENT LATTICE STRUCTURE

Leroy L. Emmel, 1800 Wallace Ave., Apt. R, Costa Mesa, Calif. 92627

Division of Ser. No. 784,603, Apr. 4, 1977, Pat. No. 4,097,324.
This application Oct. 19, 1977, Ser. No. 843,459
Int. Cl.[2] H01B 7/08, 11/00
U.S. Cl. 174—32 8 Claims







1. A lattice cable comprising:

a plurality of more than three elongated insulative elements extending parallel to one another and being interconnected along their lengths by insulative ribs at spaced locations between points of closest proximity of adjacent said insulative elements, and

said insulative elements and said insulative ribs being continuously and integrally formed from an elastic, homogeneous, thermoplastic, insulative material so that each of said insulative elements is uniform in cross section along its length, and

at least one elongated filament embedded in each of said insulative elements.

4. A lattice cable comprising:

a plurality of elongated insulative elements extending parallel to one another and being interconnected along their lengths by insulative ribs at spaced locations between points of closest proximity of adjacent said insulative elements, and

said insulative elements and said insulative ribs being continuously and integrally formed from an elastic, homogeneous, thermoplastic, insulative material so that each of said insulative elements is uniform in cross section along its length, and

at least one elongated filament embedded in each of said insulative elements with at least one of said embedded filaments having a portion of the surface thereof cntinuously exposed along its length.

7. A lattice cable comprising:

a plurality of elongated insulative elements having a first dielectric constant, said elongated insulative elements extending parallel to one another and being interconnected at spaced locations along their lengths by integrally formed insulative ribs;

at least one electrical conductor embedded in each of said elongated insulative elements;

each of said elongated insulative elements having grooves and ridges formed on an exterior surface thereof and extending along the length thereof;

at least one strip of insulative material having a second dielectric constant that is different from said first dielectric constant, said strip having grooves and ridges extending along the length thereof on an exterior surface thereof;

said ridges of said strip of insulative material mating with said grooves of said elongated insulative elements, and said grooves of said strip of insulative material mating with said ridges of said elongated insulative elements; and

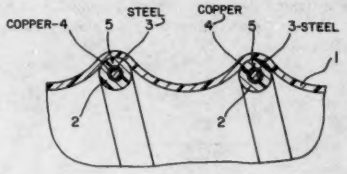
one of said ridges of said insulative strip contacting at least one of said ribs interconnecting adjacent elongated insulative elements.

4,230,899

ELECTROCONDUCTIVE HOSE FOR CLEANER

Shiro Kanao, 32-460, Nanpeidai, Takatsuki-shi, Osaka-fu, Japan

Filed Aug. 21, 1978, Ser. No. 935,375
Int. Cl.[3] A47L 9/24; F16L 11/12; H01B 5/10, 7/00
U.S. Cl. 174—47 6 Claims



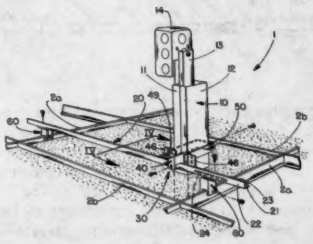
1. An electroconductive hose for cleaners comprising a bellows-shaped hose main body and two reinforcing synthetic resin elements arranged side by side axially of the hose and helically wound on and attached to the inner surface of the hose main body, each of the reinforcing helical elements having embedded therein an electrical conductor comprising a hard steel wire and a plurality of thin copper wires provided on the outer periphery of the hard steel wire and extending longitudinally thereof, said thin copper wires arranged substantially parallel to said hard steel wire.

4,230,900

POWER POLE ASSEMBLY

Larry A. Speet, Holland, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 13, 1978, Ser. No. 915,127
Int. Cl.[3] E04B 1/38
U.S. Cl. 174—48 19 Claims



1. In a power pole assembly for bringing wiring through a hollow power pole from above and through a suspended grid supported ceiling, said grid including spaced suspended rails which in turn support ceiling panels, the improvement comprising: a crossbar; pole clamping means releasably, movably mounted on said crossbar and on said pole, whereby said pole

can be secured at different heights to said crossbar and at different points along the length of said crossbar; two rail clamping means releasably, movably, and pivotally joined to said crossbar at spaced points along the length thereof, each including securing means for releasably, movably securing each to a grid rail at different points along its length, whereby said crossbar can be oriented at a plurality of different angles to said grid rails and said hollow pole can be located at a plurality of different points between adjacent grid rails and at a plurality of different angles with respect thereto; said rail clamping means comprising a bracket having a generally U-shaped lateral, horizontal cross-section defined by a back wall and a pair of spaced side walls, said side walls being notched to define hooks for hooking over a grid rail; a screw threaded through said back wall of said rail clamping means whereby said screw can be tightened against a grid rail; said rail clamping means including a tab projecting therefrom; said crossbar including at least two elongated slots extending along the length thereof, one located generally towards each end thereof; a screw passing through each said slot and being threaded into an aperture in said tab on said clamping means whereby said clamping means can be tightened on said crossbar at a plurality of pivotal angles with respect thereto and at any point along the length of said elongated slot.

4,230,901

HOUSING FOR SEMICONDUCTOR DEVICE

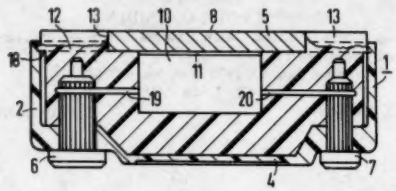
Christian Wengler, and Herbert Vogt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1979, Ser. No. 35,271

Claims priority, application Fed. Rep. of Germany, May 3, 1978, 2819499

Int. Cl.³ H05K *7/20*

U.S. Cl. 174—52 PE **5 Claims**



1. Housing for a semiconductor device, comprising a housing cup in which the semiconductor device is disposed, said housing cup having a bottom, a wall and a metal plate disposed opposite said bottom, said metal plate being thermally connected to the semiconductor device and having a mounting surface connectible to a heat sink and a lateral surface perpendicular to said mounting surface, contacts extending from inside said housing cup through said bottom and being firmly connected thereto, and cutouts formed in said metal plate at the edges thereof opposite said contacts, said mounting surface of said metal plate extending beyond said wall opposite said bottom, said housing being filled with sealing compound through said cutouts to an extent where at least part of said lateral surface of said metal plate is wetted with sealing compound.

4,230,902

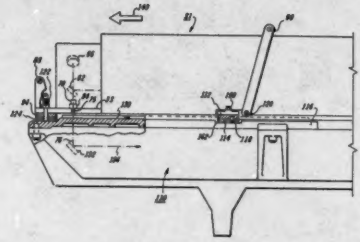
MODULAR LASER PRINTING SYSTEM

William F. Hug, Pasadena, and Leonard C. De Benedictis, Los Angeles, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1978, Ser. No. 911,021

Int. Cl.³ H04L *15/34*; H04N *1/04*

U.S. Cl. 178—15 **12 Claims**



1. In a laser printing system having means for generating a beam of high intensity light, a recording medium sensitive to said high intensity light, optical means comprising a plurality of optical elements interposed between said light generating means and said recording medium for imaging said beam to a spot at the surface of said medium, modulating means located between said light generating means and a scanner device for modulating the light beam in accordance with the information content of electrical signals, said scanner device comprising a multi-faceted polygon located in the path of said modulated beam between said beam generating means and said recording medium and having reflective facets for reflecting the beam incident thereon onto said medium, means for rotating said polygon such that the reflected light is scanned in successive traces across said medium, the improvement comprising:

a first module forming a part of said laser printing system, said first module comprising said light beam generating means and at least one of said optical elements, said light beam generating means and said at least one of said optical elements being mounted on a common base member, said first module being adapted to be removed from said laser printing system and replaced with a second module, similar to said first module, the beam of light provided by a beam generating means in said second module and exiting therefrom being maintained in optical alignment with other elements in said laser printing system external to said second module within predetermined tolerances, the light beam generated by said light beam generating means in said first module being in optical alignment with other elements in said laser printing system external to said first module and also being within said predetermined tolerances.

4,230,903

DATA TRANSMISSION SYSTEM

Takeo Fukuda, and Kazuaki Kawabata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 20, 1979, Ser. No. 31,737

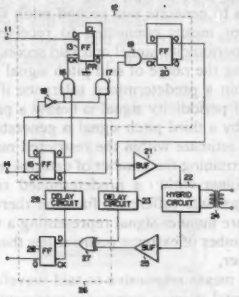
Claims priority, application Japan, Apr. 28, 1978, 53/51668

Int. Cl.³ H04L *5/14*

U.S. Cl. 370—24 **5 Claims**

1. A data transmission system for data transmission between local and remote terminals by means of a two-wire transmission line, said local terminal including a first encoder for converting binary data formed of a plurality of binary data bits into a diphase data signal having first and second portions, respectively, representing first and second binary bit states and provided, respectively, with two transitions and one transition, and a means for transmitting the diphase data signal from said

first encoder to a two-wire transmission line, said remote terminal including a means for receiving said diphase data signal from said local terminal, a decoder for decoding said diphase data signal received by said receiving means into said binary data, a second encoder for converting, under the modulating influences of said diphase data signal, data to be transmitted from said remote terminal to said local terminal, thereby pro-



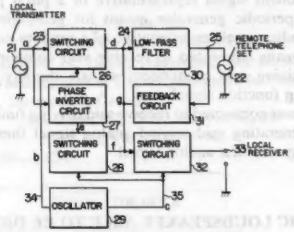
ducing a remote terminal diphase data signal, and a means for transmitting the remote terminal diphase data signal from said second encoder to said two-wire transmission line, and said local terminal further including a means for receiving said remote terminal diphase data signal from said remote terminal, and a means for demodulating said remote terminal diphase data signal by means of said diphase data signal from said first encoder.

4,230,904

SIGNAL CONTROL CIRCUIT

Kazuyoshi Fujiyoshi, and Kyoji Murakami, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1978, Ser. No. 972,368
Claims priority, application Japan, Dec. 27, 1977, 52-157654
Int. Cl.[3] H04M *1/60*
U.S. Cl. 179—1 HF **3 Claims**



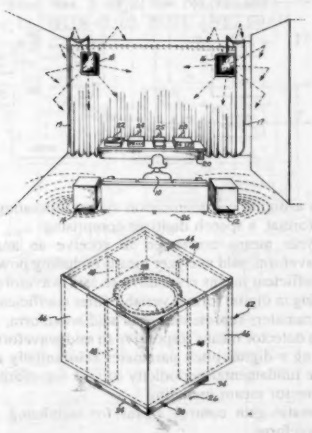
1. A signal control circuit comprising:
first input means connected to a first signal source circuit;
second input means connected to a second signal source circuit;
output means;
an oscillator having first and second outputs for generating first and second output signals, respectively, said second output signal being in opposite phase with respect to said first output signal;
a first switching circuit having inputs thereto connected respectively to said first input to said signal control circuit to and said first output of said oscillator, said first switching circuit being driven by said first output signal from said oscillator to provide a first switched output signal at an output thereof;
a second switching circuit having inputs thereto connected respectively to said first input to said signal control circuit through a phase inverter circuit and to said second output of said oscillator, said second switching circuit being driven by said second output signal from said oscillator to provide a second switched output signal at an output thereof;
a low-pass filter having an input thereto connected to a junction point of the outputs of said first and second switching circuits, the output of said low-pass filter being connected to said second input of said signal control circuit;
a feedback circuit having an input thereto connected to said second input of said signal control circuit and an output thereof connected to said junction point of the outputs of said first and second switching circuits; and
a third switching circuit having inputs thereto connected respectively to said junction point of the outputs of said first and second switching circuits and to said second output of said oscillator, said third switching circuit having an output thereof connected to said output of said signal control circuit and driven by said second output signal from said oscillator to provide a third switched output signal at said output of said signal control circuit, said signal control circuit preventing transmission of signals from said first input means to said output means despite changes in the impedances of a signal source circuit.

4,230,905

STEREOPHONIC SYSTEM WITH DISCRETE BASS CHANNELS

Ronald J. Crum, 10208 28th Ave. SW., Seattle, Wash. 98146, and Edward J. Churchill, 2835 SW. 102nd, Seattle, Wash. 98146

Continuation of Ser. No. 803,674, Jun. 6, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,029
Int. Cl.[2] H04R *5/02, 1/02*
U.S. Cl. 179—1 GA **14 Claims**



7. A subwoofer for a stereo system, comprising:
an inner housing comprising a closed bottom wall, closed side walls and a top wall including a speaker opening, together forming a first chamber;
a larger outer housing comprising a closed top wall, closed side walls, and an open lower end, said outer housing being inverted over the inner housing;
connector means between the inner and outer housing sup-

porting them in a spaced relationship, so that a second chamber is defined between the two housing, above and around the inner housing;

said inner housing having a lower end which serves as a floor contacting base; .

said outer housing having a 360° extending lower edge which is spaced above the level of said base, so that a generally downwardly directed, 360° extending outlet for the subwoofer, is formed near the base of the subwoofer, leading out from the second chamber;

an upwardly directed vibrating cone type low frequency speaker having a peripheral mounting portion bordering said speaker opening; means connecting said peripheral mounting portion to the inner housing; and

said first and second chambers being substantially balanced accoustically.

12. A stereophonic sound reproducing method, comprising:

dividing recorded stereophonic audio information into two full spectrum channels; amplifying each full spectrum information and directing it to a main speaker means for such channel; sand the improvement comprising;

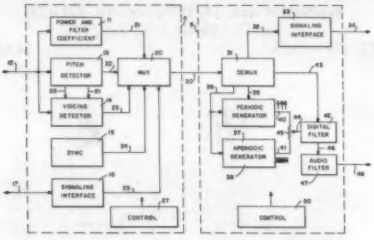
directing a duplicate low frequency portion only of each channel information to a subwoofer speaker for such channel which is physically spaced apart from the subwoofer for the other channel in a separate cabinet, and which is acoustically isolated from the subwoofer for the other channel, and with said subwoofers being spaced generally across a listening space from the two main channel speakers.

4,230,906

SPEECH DIGITIZER

Charles R. Davis, Cupertino, Calif., assignor to Time and Space Processing, Inc., Cupertino, Calif.

Filed May 25, 1978, Ser. No. 909,479
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SA **14 Claims**



1. In a digital communication system operating in a multiframe format, a speech digitizer comprising:

analyzer means connected to receive an analog speech waveform, said analyzer means including power and filter coefficient means responsive to said waveform for generating in digital format variable filter coefficient and power paramaters representative of said waveform,

pitch detector means responsive to said waveform for generating a digital pitch parameter substantially representing the fundamental periodicity of said waveform, said pitch detector means including

automatic gain control means for stabilizing said speech waveform,

converter means for converting said analog waveform to a digital format in a predetermined time frame,

means for generating a digital signal representing an absolute magnitude difference function, said digital signal having a predetermined number of samples representing the variations in the pitch of said analog waveform and having a pattern of recurring maximum and minimum points over the frequency spectra,

means for generating a first pitch signal representing the fundamental pitch of said sampled signal,

periodicity means for generating a periodicity signal representing the ratio of one of said minimum and one of said maximum points,

multiple check means connected to receive said digital signal and said first pitch signal for generating a second pitch signal when one of said multiple signals is lower than the first pitch signal by interpolating over successive ones of said samples to generate said second pitch signal,

range restrictor means connected to receive said digital signal, said periodicity signal and said second pitch signal for restricting the range of said pitch signal to a range of pitches within a predetermined tolerance if the average pitch of said periodicity signal is below a predetermined level whereby a third pitch signal is generated representing the best estimate within the restricted range, and

means for determining the number of extreme maximum and minimum points within a predetermined range of said absolute magnitude difference function thereby generating a structure number signal representing a voiced event when the number of extreme points is less than a predetermined number,

voice detector means responsive to said waveform for generating a digital voicing parameter representing whether said speech waveform is voiced or unvoiced,

multiplexer means for multiplexing said parameters into a digital serial data stream in said multiframe format where selected ones of the frames in said multiframe format occur as a synchronization frame,

synchronization means for providing a digital synchronization code whereby said multiplexer multiplexes said synchronization code into a portion of said synchronization frame,

first signaling interface means for connecting signaling information to another portion of said synchronization frame,

means for transmitting said digital serial stream,

synthesizer means connected to receive said digital serial stream for generating a second analog waveform representative of said first analog waveform, said synthesizer means including demultiplexer means for demultiplexing the transmitted parameters, the synchronization code, and the signaling information,

second signaling interface means connected to receive the demultiplexed transmitted signaling information,

periodic generator means for generating a digital periodic component signal representative of a pitch pulse signal and aperiodic generator means for generating a digital aperiodic signal representative of a random noise signal,

mixer means connected to receive said component signals for mixing said component signals thereby forming a driving function signal, and

filter means connected to receive said driving function signal for generating said second analog signal thereby representing said first analog signal.

4,230,907

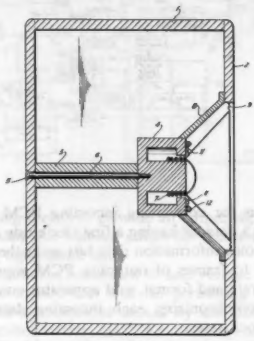
DYNAMIC LOUDSPEAKER ABLE TO BE DRIVEN AT INCREASED STEADY POWER

Wolfgang Hasselbach, Königstein; Manfred Leyerzapf, Frankfurt am Main; Klaus Dotter, Frankfurt-Bonames; Karleugen Habfast, Schwalbach, and Karl Müller, Frankfurt, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 771,798, Mar. 2, 1977, Pat. No. 4,138,593. This application Sep. 27, 1978, Ser. No. 946,834
Int. Cl.[3] H04R 1/02
U.S. Cl. 179—1 E **4 Claims**

1. In a dynamic loudspeaker of the type comprising a housing part and a sound wall part, a diaphragm mounted in the speaker, a moving-coil unit mounted in the speaker and including a moving coil coupled to said diaphragm for transmitting oscillatory motion thereto, said housing part having top, bot-

tom, rear and side parts, each of said top, bottom, rear and side parts having no aperture and no valve openings, said top, bottom, rear and side parts of said housing part being sealtightly connected with one another, at least said rear part of said housing part being made of a metal having a thermal conductivity W equal to or greater than 40 kcal/m-h-°C., said moving-coil unit including a ferromagnetic structure, said ferromagnetic structure including a central core part, an annular part surrounding the central core part and defining therewith an annular air gap, and a base part bridging together said central core part and said annular part at the rear side of said central core part and of said annular part, said heat-transmitting structure comprising a heat-transmitting bar of metal



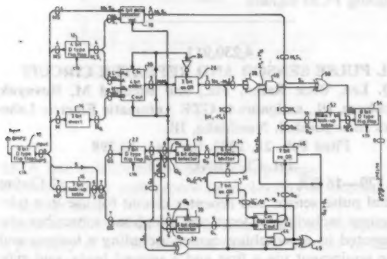
having a thermal conductivity equal to or greater than 40 kcal/m-h-°C., said heat-transmitting bar having a front face bearing against and in thermally conductive engagement with the portion of said base part of said ferromagnetic structure which is located at said central core part of said ferromagnetic structure, said heat-transmitting bar having a rear face bearing against said rear part of said housing part and being in thermally conductive engagement therewith, the surface area of said front face of said heat-transmitting bar being approximately equal to the cross-sectional area of said core part of said ferromagnetic structure, whereby said heat-transmitting bar transmits the heat mainly generated in said core part of said ferromagnetic structure to said metal rear part of said housing part.

4,230,908

TELEPHONE SUMMING CIRCUIT

John Christopher H. Davis, Oakridges, and Richard A. Hatherill, Toronto, both of Canada, assignors to Plessey Canada Limited, Downsview, Canada

Filed Jan. 22, 1979, Ser. No. 5,307
Int. Cl.³ G06F *7/50*
U.S. Cl. 179—1 CN **15 Claims**



7. Means for combining the coded digital representations of two audio analog samples in a circuit where each digital representation is a multiple bit PCM word where one bit represents the sign, a first predetermined number of bits represent M, the number of the segment numbered serially in each sense from zero analog signal and a second predetermined number of bits represent P, the value in the segment, where each increment of digital value in a segment represents twice the audio analog increment of a similar increment of digital value in the segment of next lower value, comprising:

inputs means for receiving said digital representations,

means to determine from said representations the segment number corresponding to each of said digital representations,

means to determine for each of said digital representations a factor whereby the product of the factor multiplied by two to the exponent having the value of the segment number corresponding to the representation corresponds to the analog value for such digital representation,

means to determine the difference in the segment numbers of said digital representations,

means to convert the factor corresponding to one of the digital representations into a converted factor whereby the product of the converted factor multiplied by two to the exponent having the value of the segment number corresponding to the other of said digital representations corresponds to the analog value for such one of said digital representations,

means to add the converted factor corresponding to said one digital representation to the factor corresponding to the other digital representation to produce a sum,

means responsive to said sum and such segment number of said other digital representation to produce the M and P components of said PCM word representing an analogue value corresponding to the value represented by said sum multiplied by two to the exponent of said other segment number,

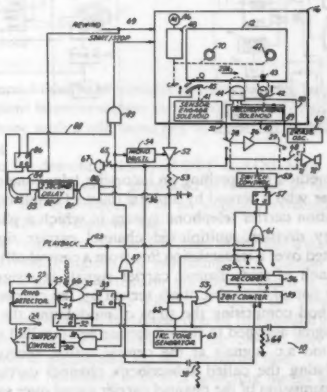
means for determining the sign of said last mentioned PCM word.

4,230,909

TELEPHONE ANSWERING MACHINE

Elliot I. Baum, Dix Hills, N.Y., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,463
Int. Cl.³ G11B *15/02, 15/18, 23/32, 23/34*
U.S. Cl. 179—6 R **17 Claims**



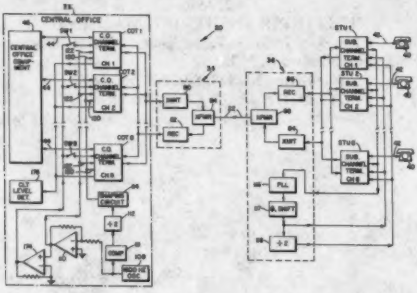
1. A telephone answering machine utilizing a single magnetic tape having a plurality of sequentially arranged announcement information sections each followed by a message information section, said sections being delimited by indicia on said tape, said machine comprising:

tape transport means for receiving said tape;
sensing means coupled to said tape;
transport means for detecting said indicia;
means for recording a desired announcement on each of said announcement information sections of said tape;
announcement control means coupled to said transport means and said sensing means, and responsive to selected ones of said indicia and to a telephone ring signal for reproducing said announcement from one of said announcement information sections as a first audio signal;
means for coupling said first audio signal to a telephone line;
message recording means coupled to said transport means and said sensing means, and responsive to a second audio signal on said telephone line for recording a corresponding message on the particular message information section of said tape adjacent and following said one announcement information section;
timing means coupled to said sensing means and responsive to selected ones of said indicia for disabling said announcement control means and enabling said message recording means a first predetermined time after occurrence of said ring signal, and for disabling said message recording means a second predetermined time thereafter; and
playback means coupled to said transport means and said sensing means, and responsive to selected ones of said indicia for reproducing from said particular message information section of said tape an audible signal corresponding to said second audio signal.

4,230,910
SIGNALLING AND CHANNEL LOOP TEST CIRCUITS FOR STATION CARRIER TELEPHONE SYSTEM

Frank L. Simokat, Babylon, N.Y., assignor to ITI Corporation, Lindenhurst, N.Y.

Filed Aug. 11, 1978, Ser. No. 932,704
Int. Cl.[2] H04J *1/06*
U.S. Cl. 370—71 **33 Claims**

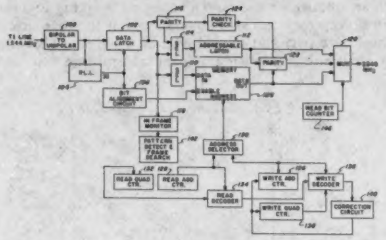


1. A method of signalling an incoming telephone call for a subscriber who is served by a plural channel amplitude modulated station carrier telephone system in which a plurality of frequency division multiplexed channel carrier signals are transmitted over a transmission line from a central office and in which each of said channel carrier signals is assigned to a different one of the subscribers served by the carrier system, said method comprising the steps of modulating the channel carrier signal assigned to the subscriber being called with first and second a.c. signals at the central office, receiving and demodulating the called subscriber's channel carrier signal upon transmission of the channel carrier signal over said transmission line to recover said first and second signals, utilizing said first signal to cause the synchronous detection of said second signal following the demodulation of the called subscriber's channel carrier signal, and ringing the called subscriber's telephone in response to the synchronous detection of said second signal.

4,230,911
CARRIER TERMINAL UNIT

Frank Fellinger, and James M. Ruffing, both of Delaware, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,456
Int. Cl.[2] H04J *3/06*
U.S. Cl. 370—84 **12 Claims**



1. Apparatus for converting incoming PCM signals each represented as a data bit having a first clock rate and arranged as frames of voice information data bits and other data bits in a first format to frames of outgoing PCM signals having a second clock rate and format, said apparatus comprising:
means for synchronizing each incoming data bit to said second clock rate;
first memory means adapted to store said other data bits from a plurality of frames;
first means for storing synchronized ones of said other data bits in said first memory means;
second memory means comprising a plurality of addressable memory locations, the number of said locations being greater than the number of voice information data bits in one of said frames;
said second memory means being organized as n overlapping groups of locations, each of said groups of locations being adapted to store one frame of voice information data bits of n successive frames of voice information bits, where n is a predetermined number greater than 1;
second means for storing synchronized ones of said voice information data bits in said second memory means at said first clock rate;
means for reading said stored voice information data bits from said second memory means at said second rate and for reading said other data bits of a preceding frame from said first memory means, said reading of said first and second memory means being in accordance with a predetermined sequence; and
means for multiplexing said other data bits read from said first memory means and said voice information data bits from said second memory means to provide said frames of outgoing PCM signals.

4,230,912
DIAL PULSE SENSOR AND REPEATER CIRCUIT

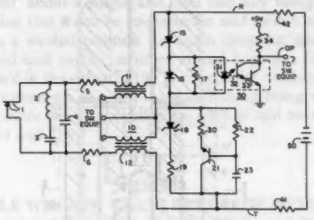
David Q. Lee, Boca Raton, Fla., and Richard M. Rovnyak, Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 21, 1979, Ser. No. 13,598
Int. Cl.[3] H04Q *1/36*
U.S. Cl. 179—16 EA **7 Claims**

1. A dial pulse sensor and repeater circuit for use in a telephone system including at least one telephone subscriber station connected to a switching center including a battery and switching equipment via a first and a second leads, said subscriber station including dial contacts for causing conductions and interruptions of a DC signal on said first and said second leads, said dial pulse sensor and repeater circuit comprising:
voltage level sensing means connected between said first and

said second leads operated to detect a particular voltage level between said leads in response to said switching center battery applied to said leads by pulses generated by said dial contacts;

optical coupler means including a light emitting diode and a resistor adjusted to provide a precise voltage and current threshold for operation of said light emitting diode, said optical coupler means connected between said voltage level sensing means and said switching equipment operated in response to said voltage level detected by voltage



level sensing means to provide an output signal representative of said dial contact pulses for transmission to said switching equipment; and

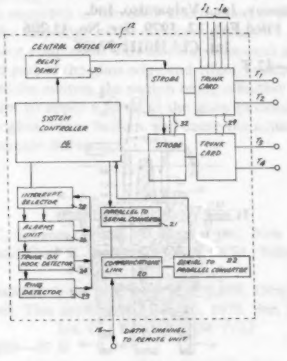
circuit timing means connected to said voltage level sensing means and to said first lead for permitting current flow during said interruptions caused by said dial contacts of said subscriber station, said circuit timing means operated during said interruptions of said dial contacts and said circuit timing means non-operated during said conductions of said dial contacts.

4,230,913

LINE CONCENTRATOR

Gene A. Brothers, Scottsbluff; John A. Neely, and Patrick W. Kieffe, both of Gering, all of Nebr., assignors to Eltra Corporation, Toledo, Ohio

Filed Jan. 4, 1979, Ser. No. 956
Int. Cl.³ H04Q *3/60*; H04J *3/00*
U.S. Cl. 179—18 FC **38 Claims**



15. A line concentrator system comprising:

a central office unit receiving a plurality of incoming subscriber lines,

a remote field unit adapted for connection to the subscribers,

a plurality of trunk lines less than the number of said subscribers,

one line in said remote unit,

means in said remote unit for connecting a subscriber line and a subscriber to one of said trunk lines and two subscribers over said one line under control of said central office unit,

means in said central office unit for connecting a called and calling subscriber over first and second trunk lines and their corresponding subscriber lines upon receiving an off hook interrupt and dialing code from said remote unit,

said means including first means for storing the identity of each subscriber connected to said remote unit, and second means determining from said interrupt, dialing code and said storage means that the called and calling subscribers are connected to said remote unit, generating a control signal sent to said remote unit for establishing connection between said subscribers over said one line and, said second means also generating another control signal to said remote unit and said central office unit for disconnecting the trunk lines connecting the called and calling subscribers and

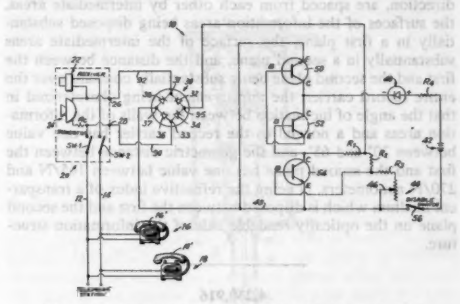
wherein said first means includes a random access memory, and said second means include a microprocessor.

4,230,914

SYSTEM FOR AND METHOD OF INDICATING INTRUDER PRESENCE ON TELEPHONE LINES, AND METHOD OF INSTALLATION OF TELEPHONE INTRUDER ALARM SYSTEM

Paul Korwin, Flushing, N.Y., and Eric S. Cohen, South Orange, N.J., assignors to Cose Technology Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,947
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.³ H04M *1/68*
U.S. Cl. 179—81 E **28 Claims**



1. A compact telephone intruder alarm system for indicating the subsequent interconnection and disconnection of an extension telephone with a telephone line to a current on-line user, comprising:

(a) means for detecting electrical OFF-and ON-hook signals which are respectively generated in response to interconnection and disconnection of an auxiliary extension telephone with a telephone line;

(b) means responsive to the detection of the electrical OFF- and ON-hook signals for indicating to a current online user of a primary extension telephone which is already interconnected with the telephone line of the subsequent interconnection and disconnection of the auxiliary extension telephone, to thereby alert the on-line user to the presence of an intruder on the telephone line;

(c) means for mounting both said detecting means and said indicating means on the primary extension telephone, to thereby simplify installation of the compact telephone intruder alarm system with conventional telephones;

(d) said primary extension telephone including a microphone transmitter and a handset having an interior; and

(e) said mounting means being operative for mounting both

said detecting means and said indicating means within the interior of the handset to thereby make the installation of the compact alarm system with conventional telephones hardly discernible, said mounting means including a carrier plate on which both said detecting means and said indicating means are mounted, and a transmitter cover mounted on the handset in overlying relationship with the microphone transmitter and said carrier plate.

4,230,915

RECORD CARRIER WITH AN OPTICALLY READABLE RADIATION-REFLECTING INFORMATION STRUCTURE

Jan G. Dil, and Bernardus A. J. Jacobs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,754

Claims priority, application Netherlands, Sep. 11, 1978, 7809227

Int. Cl.[2] G11B *7/24*

U.S. Cl. 179—100.1 G **4 Claims**

1. An improved record carrier in which information is stored in a radiation-reflecting information structure at least one side of which is readable with an optical radiation beam and which comprises information areas arranged in tracks which areas, in the track direction and transverse to the track direction, are spaced from each other by intermediate areas, the surfaces of the information areas being disposed substantially in a first plane, the surface of the intermediate areas substantially in a second plane, and the distance between the first and the second plane being substantially constant over the entire record carrier, the improvement being charcterized in that the angle of inclination between the walls of the information areas and a normal to the record carrier has one value between 30° and 65°, and the geometric distance between the first and the second plane has one value between 165/N and 270/N nanometers, N being the refractive index of a transparent medium which is disposed between the first and the second plane on the optically readable side of the information structure.

4,230,916

MULTIWAY CHANGE-OVER SWITCH HAVING JOY-STICK ACTUATOR

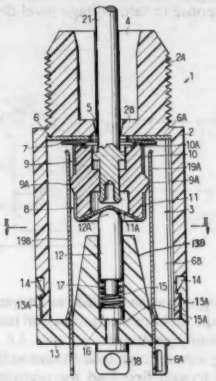
Asaji Mochizuki, Kawasaki, Japan, assignor to Showa Musen Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1978, Ser. No. 954,834

Int. Cl.[3] H01H *25/04*

U.S. Cl. 200—6 A **8 Claims**

1. A multiway change-over switch for a circuit comprising:
an electrically insulated hollow cylindrical casing including a main body portion which defines a switching chamber and a head portion which defines a lobed opening,
an upper terminal having a portion positioned on the inner surface of the top wall of said switching chamber,
a rocking change-over means rockably received in said switching chamber in contact with said upper terminal,
a lower terminal in abutment against the undersurface of said rocking change-over means for rockably supporting the rocking change-over means,
a base member secured to the bottom of said casing and loosely receiving said lower terminal,
a coiled spring positioned between said lower terminal and base member for normally urging said lower terminal against said rocking change-over means and
at least one pair of peripheral terminals positioned in diametrically opposite positions in the outer periphery of said base member and having portions extending into said switching chamber to surround said rocking change-over means, said rocking change-over means including a substantially hollow cylindrical operation member having an annular projection in the center of the outer periphery against which said peripheral terminals normally abut, an upper contact surrounding the portion of said operation



member above said annular projection and normally in contact with said upper terminal and a lower contact surrounding the portion of said operation member below said annular projection and normally in contact with said lower terminal such that said rocking change-over means can selectively contact said at least one pair of peripheral terminals with said upper and lower terminals and complete said circuit.

4,230,917

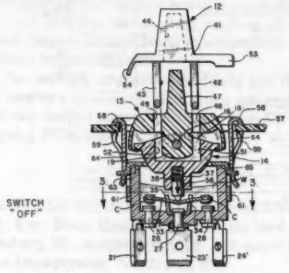
REMOVABLE-KEY ROCKER TYPE SWITCH FOR TWO CIRCUITS

Thomas F. Osika, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Feb. 12, 1979, Ser. No. 11,206

Int. Cl.[3] H01H *27/06*

U.S. Cl. 200—42 T **11 Claims**



1. In a removable key operated electrical switch of the rocker type having switch housing means with a rocker member and a carrier member and a keyway in each for receiving a key, each such member being pivotally mounted therein on an axis common to both and each being pivotal independently of the other, and contact bridging means operatively connected with said carrier member for movement upon pivotal

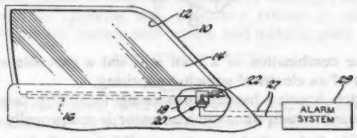
movement of said carrier member, the improvement with said housing means of stationary contact means for said contact bridging means for selectively making two different electrical circuits therethrough upon operation of said switch, and a key insertable in said switch having means for coupling together said rocker member and said carrier member at said keyways for rockably moving said members about said common axis in one of two opposite directions to complete a selected one of said two different circuits, said key being removable from said coupling of said members in said switch, being rotatable through 180° about a single axis, and said key being of such configuration that it can be reinserted in said switch after such rotation in a second position for again coupling said rocker member and said carrier member at said keyways for movement thereof in the other of the two opposite directions, with said key movements in said recited switching being such that only one circuit can be completed in each of said two inserted positions of said key.

4,230,918

VEHICLE WINDOW GLASS BREAKAGE DETECTOR

Thaddeus Schroeder, Sterling Heights, Mich., and Norman L. Traub, Cortland, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1978, Ser. No. 967,632
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.62 **5 Claims**



1. In combination, a glass breakage detector, a window glass in a vehicle door having an edge of the window glass extending into the door interior and support means engaging a portion of the said edge such that part of the glass edge is unsupported, the glass comprising a tempered glass which cracks into small pieces throughout its extent when the glass is broken, comprising

a switch mounted in the door interior and positioned adjacent the said edge of the window glass,

an actuator coupled to the switch and secured to the unsupported part of the glass edge and effective when moved to actuate the switch, the switch being effective through the actuator to apply a force to the glass to cause movement of the glass, when broken, and cause the actuator to move and actuate the switch.

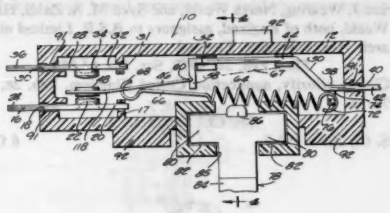
4,230,919

SNAP ACTING SWITCH

Spencer C. Schantz, 16608 W. Rogers Dr., New Berlin, Wis. 53151, and Gary R. Kuebler, 5506 N. 76 St., Milwaukee, Wis. 53218

Continuation-in-part of Ser. No. 736,608, Oct. 28, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 886,213
Int. Cl.³ H01H *21/04, 1/22*
U.S. Cl. 200—67 B **18 Claims**

1. In an electric snap-action switch having a housing, a switch blade fulcrumed within said housing, having a first electrical contact on said switch blade, having a second electrical contact mounted within said housing in cooperative relationship with said first contact, having spring means arranged to be movable to either side of the fulcrum for said switch blade to cause snap opening and snap closing of said contacts, and having actuator means positioned to be responsive to an external force for shifting a portion of said spring means from one side of said fulcrum to the other, the improvement wherein said actuator means comprises a lever, means for pivotally mounting said lever on said housing intermediate its length for rocking movement about an axis parallel to the longitudinal axis of said spring for movement of the lever in a plane transverse to said spring and the longitudinal extent of said switch



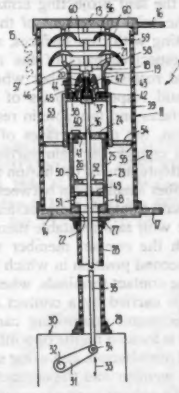
blade and having an external end and having an integral inner portion positioned for swinging in response to said rocking movement in a direction to engage and shift a portion of said spring means over center with respect to said fulcrum.

4,230,920

GAS-BLAST SWITCH

Richard Thaler, Unterentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 20, 1978, Ser. No. 962,217
Claims priority, application Switzerland, Mar. 30, 1978, 3404/78
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A **7 Claims**



1. A gas-blast switch comprising:

a gas tight electrically insulating housing;

said insulating housing defining a blast chamber therein;

a fixed contact surrounded by said blast chamber arranged within said insulating housing;

a movable contact arranged within said insulating housing;

a pump device;

a blast nozzle connected with said pump device and movable along with said movable contact;

said pump device comprising a pump cylinder movable in conjunction with said movable contact;

a stationary pump piston upon which there is displaceable said pump cylinder;

means operatively coupled with said pump cylinder and impinged by pressurized gas heated by the arc in order to augment the pumping stroke of the pump device; and

said means coupled with said pump cylinder comprises an

impact plate secured to the periphery of said pump cylinder and radially protruding therefrom.

4,230,921

ELECTRIC SWITCH

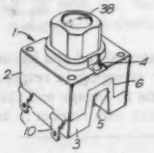
Brian J. Wearing, North Weald, and Syed M. A. Zaidi, Harrrow Weald, both of England, assignors to B.S.R. Limited of Monarch Works, Warley, England

Filed Feb. 26, 1979, Ser. No. 14,885

Claims priority, application United Kingdom, Feb. 28, 1978, 7978/78

Int. Cl.³ H01H *3/52*

U.S. Cl. 200—153 J **8 Claims**



1. An electric switch adapted to be opened and closed by successive operations of a push-button, said switch comprising a housing containing two fixed terminal members, a push-button protruding from the housing and movable axially into the housing against the bias of a spring, a rotatable member movable axially in response to movement of said button, radially projecting arms on the rotatable member defining cam surfaces, guide ribs formed within the housing and located to co-operate with the said projecting arms to guide said arms during part of the axial movement of the rotatable member, said ribs terminating with cam surfaces, stop surfaces located between some respective pairs of the ribs to restrict axial movement of said rotatable member when said arms are located between said respective pairs of ribs, further means carrying cam surfaces and movable in response to movement of the push-button, the cam surfaces of said further means being adapted to engage the cam surfaces of the rotatable member on each depression of the button to move said arms of the rotatable member axially from between said ribs and subsequently to rotate said rotatable member, and an electric contact member movable with said rotatable member between a first position in which the contact member touches the contact terminals, and a second position in which the contact member does not touch the contact terminals, wherein the said electric contact member is carried by a contact carrier which comprises said further means comprising cam surfaces, and the rotatable member is located on the opposite side of the contact carrier to the said push-button, and a first spring is provided to bias the rotatable member and the contact carrier away from said terminals and a second spring is provided to bias the said contact carrier towards said terminals, said housing defining two upstanding fingers which surround the first spring and which are arcuate in plan, the fingers having a common radius of curvature and a common centre of curvature, said guide ribs being formed on the innermost surfaces of said arcuate fingers, the lower surfaces of said guide ribs being inclined to form said cam surfaces, and the arrangement is such that when the switch is in an initial condition in which the projecting arms engage with said stop surfaces the contact carrier is retained in a first predetermined position in which the contact member touches the contact terminals, subsequent depression of the push-button causing the cam surfaces of the contact carrier to engage the corresponding cam surfaces of the arms of said rotatable member to rotate said rotatable member whilst moving the rotatable member against the bias of the first spring, subsequent release of the push-button permitting the rotatable member to be moved by the bias of the first spring, against the bias of the second spring, the rotatable member being further rotated by engagement of the cam surfaces of said arms with the cam surfaces defined by the guide ribs of the housing to a position in which the rotatable member is free to move axially in response to the bias of the first spring, the contact carrier thus being moved to a second position in which the contact member does not touch the contact terminals, the switch being returnable to its first condition by a subsequent depression and release of the push-button, which causes further rotation of the rotatable member so that the arms of the rotatable member again engage the stop surfaces.

4,230,922

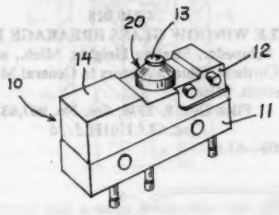
SEAL ASSEMBLY FOR SWITCH ACTUATOR

John W. Habecker, Zion, Ill., assignor to Cherry Electrical Products Corp., Waukegan, Ill.

Filed Apr. 30, 1979, Ser. No. 34,255

Int. Cl.³ H01H *9/04*; F16J *15/32*

U.S. Cl. 200—302 **1 Claim**



1. The combination of a boot seal and a movable switch actuator of an electrical switch comprising,

a switch housing having an opening formed in one wall through which the switch actuator is reciprocally movable,

a circular switch actuator movably positioned in said opening and having an end portion positioned externally of said housing and provided with an exposed concave groove,

a recessed circular bearing is provided by the one wall of the switch housing and defines the opening through which said switch actuator is movable,

a boot seal of resilient material adapted to extend between and be connected to said circular bearing and said switch actuator,

said boot seal having a base ring the inner diameter of which is adapted to fit into the recess provided by said bearing so as to attach said boot seal to said switch housing,

a cylindrical stabilizing means provided by said boot seal and extending at right angles from said base ring and parallel to said actuator,

a truncated cone projecting outwardly of said stabilizing means and providing a center opening the diameter of which is equal to said concave groove formed in the wall of said switch actuator so as to connect the top of said boot seal to said actuator,

said cone collapsing uniformly within said stabilizing means as said actuator is moved through the opening formed in said switch housing wall while maintaining the sealing connection of said base ring with said circular bearing and said center opening of said cone with said concave groove formed in said switch actuator.

4,230,923

DEVICE FOR INDUCTION WELDING

Jan-Bertil Jeppsson, Lomma, Sweden, assignor to AB Akerlund & Rausing, Sweden

Filed Jun. 2, 1978, Ser. No. 912,084

Claims priority, application Sweden, Jun. 20, 1977, 7707091

Int. Cl.³ B23K *13/02*; H05B *6/42*

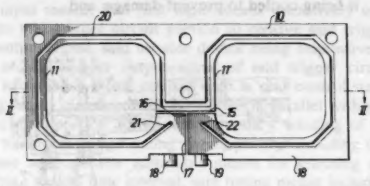
U.S. Cl. 219—10.53 **10 Claims**

1. A device for inductive welding comprising:

metallic plate means having an arbitrary contour formed of

highly conductive material, said metallic plate means having at least one aperture therein configured to admit materials to be welded, and said metallic plate means having a slot therein defining a high frequency current path within said metallic plate means about said aperture;

cover plate means configured to cover at least a portion of said metallic plate means about said at least one aperture, said cover plate means being made of nonconductive material and having therein at least one aperture corresponding generally in configuration to said at least one



aperture within said metallic plate means when said cover plate means is in a covering relationship therewith, said metallic plate means and said cover plate means defining a cooling fluid groove therebetween in the form of a closed passage disposed substantially about said at least one aperture for conveying cooling fluid thereabout, said cooling fluid groove defined being configured to cool said metallic plate means in response to inductive heating; and

means for applying high frequency voltage to said high frequency current path within said metallic plate means.

4,230,924

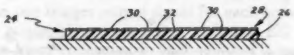
METHOD AND MATERIAL FOR PREPACKAGING FOOD TO ACHIEVE MICROWAVE BROWNING

William A. Brastad, Minneapolis, and Nelson J. Beall, St. Michael, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 910,262, May 30, 1978, abandoned. This application Oct. 12, 1978, Ser. No. 950,759

Int. Cl.³ H05B *6/80*; B65D *81/34*

U.S. Cl. 219—10.55 E **21 Claims**



1. A package containing an article of food, at least a portion thereof being capable of having either its color changed or crispened, said food article to be heated in a microwave oven, comprising a flexible dielectric material having at least a section thereof conforming generally to the shape of said portion of the food article, and individual electrically resistive islands carried by said dielectric material for converting some of the microwave oven energy to heat, said electrically resistive islands also conforming generally to the shape of said portion of food and residing in a proximal relation therewith, whereby the microwave energy converted to heat by said dielectric material and islands modifies the color or crispness of the food portion adjacent thereto.

4,230,925

CIRCUIT BOARD WIRE BONDING AND CUTTING APPARATUS

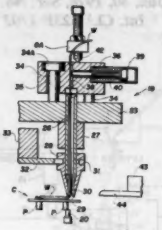
Daniel J. Lascelles, De Land, Fla., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 28, 1978, Ser. No. 937,412

Int. Cl.³ B23K *11/16*

U.S. Cl. 219—56.1 **12 Claims**

1. Wire bonding and cutting apparatus for establishing wire circuits to several terminals in a printed circuit board, said apparatus comprising: a hollow electrode having an end engageable with the circuit board terminals; a supply of circuit wire extending through said hollow electrode and protruding from said electrode end; means adjacent said electrode end and operable to wipe across the electrode end and bend the protruding wire at least into a 90° bent position; means operable to advance said electrode and bent wire into contact with a first one of the circuit board terminals to weld the wire to start a



circuit and to weld another portion of the wire to at least one other terminal; tubular cutter means telescopically related to said electrode and having a cutter end adjacent said electrode end; and means operably connected to said tubular cutter to move the tubular cutter relative to said electrode and advance said cutter end into wire cutting position beyond said electrode end at the one other terminal to end the circuit.

4,230,926

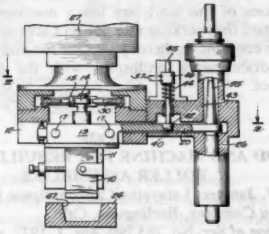
ELECTRIC DISCHARGE MACHINE WITH MECHANISM FOR ORBITING THE ELECTRODE

William J. Gaumond, 2556 N. 96th St., Wauwatosa, Wis. 53226

Filed May 1, 1978, Ser. No. 901,958

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 V **4 Claims**

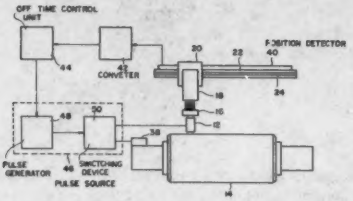


1. In an electric discharge machine having an electrode holder and means for driving said holder on an orbital path, said means including a post on the electrode holder, a rotor about the post and a first resiliently loaded drive arm mounted on the rotor and engaged with the post, the improvement comprising a second resiliently loaded drive arm mounted on the rotor and engaged with the post at a point offset circumferentially from the point of engagement with the post of the first-mentioned drive arm whereby the post is subject to the composite driving force of both drive arms.

4,230,927
APPARATUS FOR ELECTRICAL DISCHARGE MACHINING OF CYLINDRICAL WORK

Kunihiko Sato, Owari-Asahi; Tetsuro Urata; Tetsuhiro Asamoto, both of Nagoya; Kobun Asakawa, Fukuyama; Takeo Uebayashi, Fukuyama, and Haruo Taguchi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,984
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 C **1 Claim**



1. In an electrical discharge machining apparatus comprising a pulse generator and a switching device for applying a pulse voltage across an electrode and a cylindrical work in response to output pulse signals from said pulse generator, wherein an electrical discharge machining is effected on the outer surface of said cylindrical work by means of a working current while rotating the cylindrical work and moving said electrode and said work relative to each other in the direction of the axis of rotation of said cylindrical work to define an electrode working area, the improvement wherein said apparatus comprises:

an electrode position detecting means for detecting a decrease in the electrode working area caused when the end portions of the cylindrical work are being machined and generating an output signal corresponding thereto;

converter means for generating a signal proportional to a deviation between the output signal of said electrode position detecting means and a preset value caused when the former exceeds the latter; and

a control unit for controlling said pulse generator so as to change the output pulse signals thereof in accordance with the signal from said converter means;

said pulse generator, said switching device, said electrode position detecting means, said converter means and said control unit working together to decrease the working current in proportion to a decrease in the area where the cylindrical work is to be machined, caused when the end portions of the work are being machined, whereby to maintain the working rate per unit area of the cylindrical work constant to thereby satinize the end portions of the cylindrical work uniformly with the central portion thereof.

4,230,928
METHOD AND MACHINE FOR REBUILDING TRACK ROLLER ASSEMBLIES

Harvey W. Janssen, Lafayette, Calif., assignor to Wolff Manufacturing Company, Burlingame, Calif.

Continuation of Ser. No. 783,790, Apr. 1, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,112
Int. Cl.³ B23K *09/04*
U.S. Cl. 219—76.11 **4 Claims**

1. A machine for rebuilding by welding hard metal on track roller assemblies of the type having an external rim rotatably supported by an internal structure with lubricant passages formed in and between said internal structure and rim including:

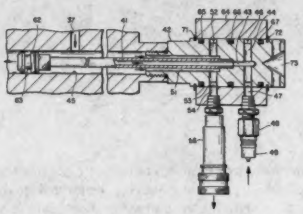
means for supporting said track roller assembly;

means for rotating at least the rim of said track roller assembly;

a first coolant probe adapted to be inserted into a lubricant passage of said roller assembly to circulate coolant through said passages to cool the roller assembly;

welding means for depositing metal on the surface of said rim as it is rotated;

a second coolant probe adapted to be inserted into a lubricant passage of a second track roller assembly to circulate coolant through said passages to cool said second roller assembly after said second roller assembly has been rebuilt, whereby while the roller assembly is supported in the machine and being welded said second roller assembly is being cooled to prevent damage; and

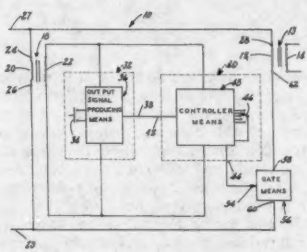


a coolant system for circulating coolant through said lubricant passages; said system including a fluid reservoir, means for supplying coolant from said reservoir to each of said probes for circulation through said passages, means for monitoring the temperature of the coolant in said roller assemblies and means for controlling the reservoir coolant temperature so that the temperature of the coolant entering and leaving said roller assemblies has a temperature within a predetermined temperature range.

4,230,929
CONTROL CIRCUIT FOR A WELDING DEVICE

Bruce A. Blair, and Howard G. McClure, both of Jackson, Mo., assignors to Lenco, Inc., Jackson, Mo.

Filed Jan. 12, 1978, Ser. No. 868,899
Int. Cl.³ B23K *11/00*
U.S. Cl. 219—111 **11 Claims**



1. A control circuit for a welding device for establishing a weld time duration and controlling the time duration completion of a power circuit to the welding device comprising first and second connection means for connecting said control circuit to a power source, a welding transformer having primary and secondary windings thereof, said primary winding having first and second terminals thereon, a control transformer having primary and secondary windings thereof, said primary winding having first and second terminals thereon, said first terminal of the primary winding of the control transformer being connected to said first terminal of the primary winding of the welding transformer and to said first connection means, said second terminal of the primary winding of the control transformer being connected to second connection means, a trigger circuit portion connected across said second-

ary winding of the control transformer, said trigger circuit portion including operator actuatable means and means for producing a trigger output signal in response to actuation of said operator actuatable means, said means for producing a trigger output signal including a pulse generator for generating periodic signals and gate means, said gate means being responsive to the generation of a periodic signal at a time when said operator actuatable means are actuated to produce a trigger output signal, control status means capable of being in one of two control states and including a bistable device with first and second input means, said first input means operatively connected to said trigger circuit portion to receive said trigger circuit output signal, said bistable device being responsive to receipt of said trigger output signal of said trigger circuit portion to establish a first control state in said control status means, a timing circuit portion connected in parallel with said trigger circuit portion across said secondary winding of the control transformer, said timing circuit portion including timing means and operator adjustable means for selecting and establishing a weld time interval, said timing means including means for detecting the control state of said control status means and time passage means responsive to detection of the first control state of said control status means for generating a time interval output after the passage of an amount of time equal to the selected weld time interval established by the selective adjustment of said operator adjustable means, said second input means of said control status means connected to said timing circuit portion to receive said time interval output, said bistable device being responsive to receipt of said time interval output of said timing circuit portion to establish a second control state in said control status means, a gating circuit having gate input means connected to said second terminal of the primary winding of the welding transformer and gate output means connected to said second connection means, said gating circuit including control input means connected to said control status means to detect the control state thereof and other means responsive to detection of said first control state of said control status means for completing a circuit between said gate input means and said gate output means, said circuit completion enabling current to flow through said primary winding of said welding transformer so long as said control status means is in said first control state, means responsive to establishment of said first control state in said control status means for preventing the production of more than one trigger output signal for each activation of said operator actuatable means, and a high-pass RC filter circuit having an input connected to said operator actuatable means and an output connected to said gate means, said responsive means for preventing the production of more than one trigger output signal for each activation of said operator actuatable means including means to alter the time constant of said filter circuit.

4,230,930

LASER WELDING METHOD FOR ELECTRICAL WIRE CONNECTION TO A TERMINAL PIN OF AN EXHAUST GAS SENSOR

Uck I. Chang, Farmington Hills, and Kenneth W. Casey, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

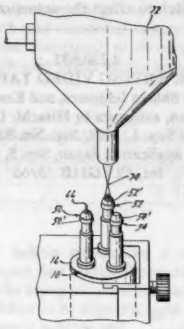
Filed Jan. 25, 1979, Ser. No. 6,943
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LD **11 Claims**

1. A method for welding an electrical lead wire to a terminal pin, the terminal pin having a head with an internal opening, the electrical lead wire being received within the opening and having a portion extending to the exterior of the terminal-pin head, the method comprising the steps of:

(a) supporting the terminal pin with the head thereof being located such that the portion of the electrical lead wire extending therefrom is substantially vertical and the exterior portion of the lead wire has its end terminating a predetermined distance above the terminal-pin head;

(b) positioning a laser beam source above the exterior portion of the lead wire;

(c) causing the laser beam from the source to be propagated in a direction substantially coinciding with the force of gravity, the laser beam having a focal point located above the electrical lead wire end and the laser beam impinging on the end of the electrical lead wire and on the head of the terminal pin; and



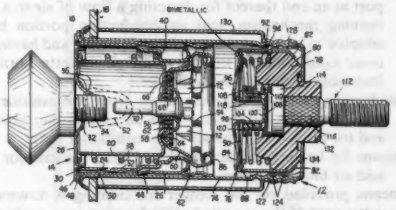
(d) applying the laser beam to the electrical lead wire and terminal-pin head, as specified in step (c) above, for a time period sufficient to enable the end of the electrical lead wire to liquify, to progressively move in the liquified state toward the terminal-pin head, and thereafter to coalesce with metal in the terminal-pin head concurrently liquified by the laser beam.

4,230,931

ELECTRIC CIGAR LIGHTER

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,023
Int. Cl.³ F23Q *7/24*
U.S. Cl. 219—265 **38 Claims**



1. A cigar lighter, comprising in combination:

(a) a holder device including a socket having two electrical contacts forming part of a cigar lighter electrical circuit,

(b) an ignitor plug receivable in the socket and constituting a manually-operable part movable in the socket between energizing and de-energizing positions,

(c) said plug having an electrical resistance heating coil carried at its inner end,

(d) means for establishing an electrical circuit from the holder device electrical contacts through the heating coil when the said plug is shifted to its energizing position, said means including an electrical switch having relatively-movable cooperable electrical contact parts, all of which are carried by the holder device, and

(e) means responsive to heating to said heating coil, for actuating said electrical switch to break said electrical

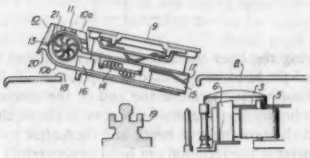
circuit and de-energize the coil, said means including a bimetallic member carried by said holder device and having a circuit-opening position and a closed-circuit position, said bimetallic member carrying no electrical current and having an actuator portion which is free and clear of permanent attachment to any other parts, said actuator portion being adapted for abutting engagement with one of the cooperable electrical contact parts of said electrical switch to effect the actuation thereof.

4,230,932

BLOWERS FOR DRYING VIDEO TAPE RECORDERS

Kathumi Mikamo; Shinya Ichimura, and Kenichi Yamaguchi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 1, 1978, Ser. No. 938,958
Claims priority, application Japan, Sep. 5, 1977, 52-118534[U]
Int. Cl.³ G11B *15/60*
U.S. Cl. 219—370 **5 Claims**



1. A blower for drying a tape running mechanism of a video tape recorder including a tape guide cylinder provided with a rotary head and a cassette holder for guiding a tape cassette between an open position and a playback or record position, the blower comprising:

an air conducting portion having a laterally widened outlet port at an end thereof for directing a flow of air to a tape running mechanism, said air conducting portion being adapted to be inserted into a cassette holder and having an outer configuration similar to a tape cassette normally insertable into the cassette holder;

air blowing means for taking in air from the exterior, for conveying the air through said air conducting portion, and for discharging the air from said outlet port;

means for heating the air introduced from the exterior into said air blowing means; and

means provided on the blower for limiting a downward movement of the cassette holder from an open position to a playback or record position when the air conducting portion is inserted into the cassette holder.

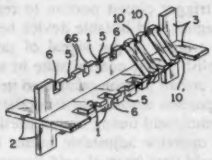
4,230,933

ELECTRIC AIR HEATING ELEMENT

Dov Z. Glucksman, 43 Norwood Ave., Newton, Mass. 02159, and Karl H. Weidemann, Brookline, Mass., assignors to Dov Z. Glucksman, Newton, Mass.

Filed Feb. 17, 1978, Ser. No. 878,945
Int. Cl.³ H05B *3/02*
U.S. Cl. 219—375 **6 Claims**

1. In combination, a tubular air discharge unit and heating element for a hair dryer, said element being positioned in said tubular air discharge duct in coaxial alignment therewith, said heating element comprising a solid coil-carrier of non-conductive and heat resistant material and including at least four longitudinal fins extending radially outwards from a common center line coinciding with the axis of such an air duct, said fins being of equal thickness and having the major extent of their outer edges serrated by inwardly extending substantially rectangularly shaped sets of notches of at least two different depths, said notches being equally spaced by a common spacing module and adjacent sets of notches having a different common depth so as to be intermittently higher and lower throughout such major extent of such outer edges, said notches being axially staggered by a quarter spacing module in respect



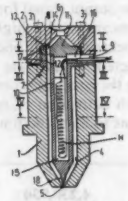
of every two fins lying at right angles to one another to provide a helical path for resistor element, and a coil in the shape of a flat ribbon resistor wound helically around said coil carrier with the windings being laid successively in said notches with the ribbon lying in the bottom of the notches and extending parallel to the outer edges of the fins to provide intermittent layers in different parallel planes to provide high heat transfer with low flow resistance and to increase air turbulence around the said coil to facilitate breaking up the air boundary layer and providing at least one crossover of the ribbon.

4,230,934

INTERNALLY HEATABLE NOZZLE HAVING A DIVISIBLE HOUSING AND A DIVISIBLE CORE

Albertus ter Beek, and Gerrit J. ter Beek, both of Hengelo, Netherlands, assignors to Ter Beek Hengelo (T.B.H.) B.V., Hengelo, Netherlands

Filed May 8, 1979, Ser. No. 37,039
Int. Cl.³ F27B *14/00*
U.S. Cl. 219—421 **7 Claims**



1. An internally heatable nozzle comprising a divisible housing having a cylindrical bore narrowed at one end towards a mouth opening of the nozzle, in which bore a cylindrical, divisible core of thermally conductive material is connected at one end in said housing, said core having a conical end proximate to and tapering toward said mouth opening and being provided with an internal heating element with connecting leads passed laterally through said housing, an annular channel being arranged between said core and said housing and connected with at least one feeding channel passing through the housing on the side remote from the mouth opening, said core being divisible in a transverse direction to present two parts provided with directly adjacent flanges, said flanges having axially extending channels communicating said feeding channel with the channel between the housing and the core and said flanges fitting between inner shoulders on the two parts of the

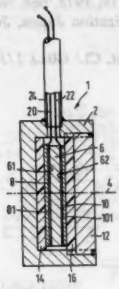
housing, between which parts tensile elements are operative to tighten the core parts together.

4,230,935

IMMERSION HEATER

Hans Meixner, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 13, 1979, Ser. No. 12,053
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806159
Int. Cl.³ H05B 3/06
U.S. Cl. 219—523 8 Claims



1. A liquid immersion high output heater, comprising: a sealed metal housing means having heat conductive walls for immersion into a liquid to be heated; said housing means having mounted therein an electric heating element provided with current feed lines; an insulation means insulating at least one of the feed lines and a portion of the heating element from the housing means; the heating element being a positive temperature coefficient (PTC) thermistor means comprising ferroelectric ceramic material for automatic overheating cutoff; said heating element being formed as a thin 0.5 to 2 mm thick flat disc-like member on whose two major surfaces lying opposite one another the current feed lines are attached by metal electrodes over the entire respective major surfaces of the heating element; the major surfaces of the heating element each having a same heat contact with said housing heating surfaces; and the PTC thermistor means material having a Curie temperature T_C lying at least 50° K. above a given desired cutoff temperature T_A, and having a specific resistance at the Curie temperature T_C of

$$\rho_{TC}=(U^2/0.08(T_C-T_A)$$

with a tolerance width of approximately $0.5\cdot\rho_{TC}$ to $2\cdot\rho_{TC}$, where U is a given operating voltage, whereby a high power output immersion heater of greatly improved reliability is provided.

4,230,936

BIORHYTHMIC SLIDE RULE

Daniel P. Oerth, 10124 Rosin Ave., Whittier, Calif. 90603

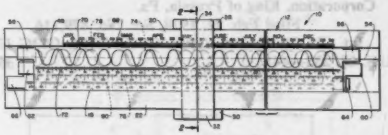
Filed Feb. 17, 1978, Ser. No. 878,708
Int. Cl.³ G06G 1/06
U.S. Cl. 235—70 A 3 Claims

1. A biorhythmic slide rule comprising:

a housing having a guide track assembly, said guide track assembly comprising three (in number) separate adjacent parallel guide tracks, there being a separate said slide located within a separate said track, said housing having a front side, a first sequential indicia located on said front side;

a member movably mounted on said housing, said member having a thin hairline the longitudinal axis of which is located transverse to the longitudinal arrangement of said first indicia;

a first substantially transparent slide and a second substantially transparent slide and a third substantially transparent slide being movably mounted within said guide track assembly, each said slide including a different opaque sine wave curve, said sine wave curve being observable through said front side of said housing in an overlying relationship, each said slide having a sequential series of numerical indicia arranged adjacent its respective said sine wave curve, each said numerical indicia having an established upper limit correlated to its respective said sine wave curve with said upper limits being different, each



said numerical indicia comprising a series of opaque evenly spaced apart first marks, the spacing between each of said first marks being identical for each said numerical indicia, said hairline to be alignable with said first mark of each said numerical indicia; and

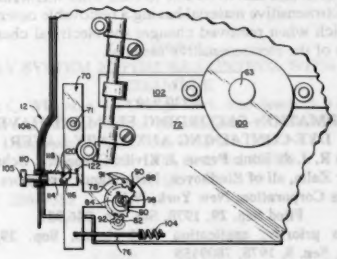
handle means attached to each said slide to facilitate sliding movement and positioning of each said slide within its said guide track assembly, said handle means comprises a longitudinal extending member located at each longitudinal end of each said slide, with said slide located in an overlying relationship the said extending members at each said end being located in a staggered relationship in respect to each other.

4,230,937

FUEL DELIVERY SAFETY LIMIT MECHANISM

Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Mar. 23, 1979, Ser. No. 23,239
Int. Cl.³ B67D 5/22; G06C 15/42
U.S. Cl. 235—94 R 5 Claims



1. In a fluid dispenser having a resettable register for registering the amount of fluid dispensed, a fluid delivery system with control means selectively operable to activate and deactivate the fluid delivery system for dispensing fluid and a limit mechanism for operating the control means to deactivate the delivery system after an established amount of fluid is dispensed, the improvement wherein the limit mechanism comprises trip gearing with a rotary drive gear rotated by the resettable register in accordance with the amount of fluid dispensed and a rotary trip gear in operative intermeshing engagement with the drive gear and rotated thereby in one angular direction during the delivery of fluid from an initial angular position thereof to a trip angular position thereof, the trip gear having a circumferentially extending peripheral re-

cess for receiving the drive gear when the trip gear reaches its trip position, a shiftable trip member rotatably supporting the trip gear and shiftable from a first position of the trip member to a second trip position thereof, when the trip gear receives the drive gear at its trip angular position, to operate the control means to deactivate the dispenser, and reset means for resetting the trip gear to its said initial angular position and the trip member to its first position.

4,230,938

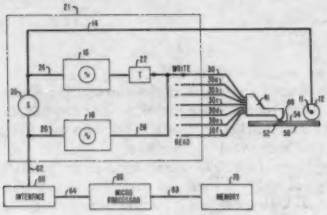
COMPUTER INPUT/OUTPUT DEVICE

George D. Margolin, Newport Beach, and Victor V. Vurpillat, Laguna Niguel, both of Calif., assignors to Centurion Data Corporation, King of Prussia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,116

Int. Cl.[2] G06K *7/06, 19/06;* **G01D** *15/08;* **G03G** *17/00*

U.S. Cl. 235—441 **35 Claims**



1. An input and output device able to read from and write on electrosensitive material comprising:

first sensing means; said sensing means comprising a plurality of styli;

first controlling means for controlling said sensing means, said control means having a high level output and a low level output and a switch means to control which output level is operative;

first moving means for causing relative motion between said sensing means and said paper; and,

said first sensing means is operable under the control of said first controlling means to write on said electrosensitive material and also to be able to read what was written, said electrosensitive material having a removable outer surface which when removed changes the electrical characteristics of the electrosensitive material.

4,230,939

INFORMATION-RECORDING ELEMENT HAVING A DYE-CONTAINING AUXILIARY LAYER

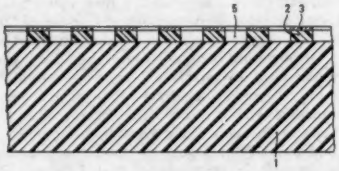
Marinus R. J. de Bont; Petrus J. Kivits; Cornelis J. Schoot, and Pieter Zalm, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 946,987

Claims priority, application Netherlands, Sep. 29, 1977, 7710634; Sep. 8, 1978, 7809159

Int. Cl.[2] G06K *19/02, 7/00;* **G01D** *15/10*

U.S. Cl. 235—488 **6 Claims**



1. An improved information-recording element in which information can be written and read optically, which comprises a transparent substrate, an auxiliary layer provided on the substrate, an information-recording layer which is provided on and abuts the auxiliary layer and having a reflecting power with respect to a laser light beam used for writing or reading, the improvement being characterized in that the auxiliary layer is a laser light-absorbing dye-containing layer.

4,230,940

AUTOMATIC FOCUSING APPARATUS

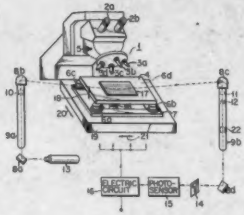
Masana Minami, and Tomohide Watanabe, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 14, 1978, Ser. No. 924,722

Claims priority, application Japan, Jul. 22, 1977, 52-87271; Feb. 8, 1978, 53-12367

Int. Cl.[3] G01J *1/36*

U.S. Cl. 250—201 **15 Claims**



1. An automatic focusing apparatus for focusing a lens system for the observation of a sample placed on a stage on the surface of said sample, comprising: a collimated beam source; an incident optical means for leading a collimated beam from said collimated beam source to said sample surface at a predetermined inclined incident angle in an incident pattern, said incident pattern having a flattened shape; photosensitive means to produce an electric signal corresponding to the intensity of light received; a reflection optical means for receiving the collimated beam reflected from said sample surface, said reflection optical means including an imaging lens means for imaging an image of said incident pattern on said photosensitive means; a detecting means for detecting a shift distance of said sample in the direction of the thickness thereof by means of the electric signal from said photosensitive means and for producing a signal corresponding to said shift distance; and shift means for shifting said stage in the direction of the thickness of said sample by means of a signal from said detector means to focus said lens system on said sample surface, wherein said automatic focusing apparatus is optically separate from said lens system.

4,230,941

CORRECTOR LENS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 26, 1979, Ser. No. 23,865

Int. Cl.[3] G01J *1/36*

U.S. Cl. 250—204 **13 Claims**

5. Apparatus of the class described comprising, in combination:

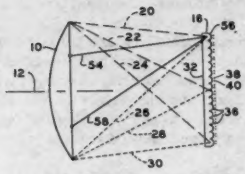
a moveable objective lens for focusing radiation from a remote object and when properly positioned to provide an image of the object at a first image plane;

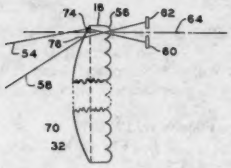
a plurality of lenslets each having an optic axis and mounted proximate the first image plane;

a corrector lens mounted between said objective lens and said plurality of lenslets so that radiation from said objective lens is directed by said corrector lens to the lenslets and each lenslet directs radiation generally symmetrically

about its optic axis to provide an image of the exit pupil of said objective lens at a second image plane; and

a plurality of radiation responsive detectors mounted proximate the second image plane and arranged in pairs so that





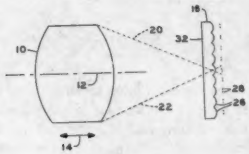
the detectors of each pair are mounted substantially equidistant on opposite sides of the optic axis of each lenslet and receive substantially equal radiation when said objective lens is properly positioned.

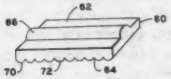
4,230,942

CROSSED CYLINDRICAL LENS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 26, 1979, Ser. No. 23,866
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **11 Claims**





1. In apparatus for use in an optical system having an objective lens, the objective lens having an optic axis and producing an image of a remote scene at an image plane, lenslets means mounted proximate the image plane and operable to produce an image of the exit pupil of the objective lens and radiation detector means mounted within the image of the exit pupil, the improvement comprising:

a first cylindrical lens forming a part of the lenslet means, said first cylindrical lens extending in a first direction on a first plane substantially perpendicular to the optic axis; and

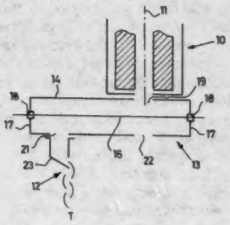
a plurality of second cylindrical lenses forming a part of the lenslet means spaced from said first cylindrical lens along the optic axis and extending in a second direction on a second plane substantially perpendicular to the optic axis and transverse to the first direction so that the image of the exit pupil is oblong.

4,230,943

MASS SPECTROMETER

Jochen Franzen, Wildehausen, and Gerhard Weiss, Varrel I, both of Fed. Rep. of Germany, assignors to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft, Bremen, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,414
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754685
Int. Cl.² B01D *59/44*; H01J *39/34*
U.S. Cl. 250—281 **11 Claims**



1. A mass spectrometer, comprising:

an ion source;

a mass filter having an axis;

at least one ion detector;

said mass filter and said ion detector being arranged not in alignment but laterally staggered to each other; and

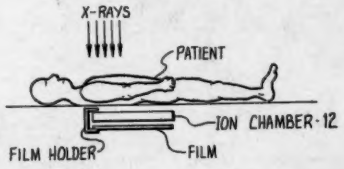
a metal wire for the generation of an elongated electrostatic, essentially cylindrical, radial guide field extending between said mass filter and said ion detector, which guide field guides ions with a velocity component extending axially to the guide field into elliptic helical paths about its axis toward the input of said ion detector, said metal wire essentially extending between said mass filter and said ion detector, said wire being charged with a charge opposite to ions to be examined, said wire being fastened by clamping only on one side and, on its free end, being bent toward said mass filter in the direction of said axis of said mass filter.

4,230,944

X-RAY SYSTEM EXPOSURE CONTROL WITH ION CHAMBER

Douglas C. Wiegman, La Grange Park, and James A. Grichnik, Elk Grove Village, both of Ill., assignors to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Feb. 9, 1979, Ser. No. 10,550
Int. Cl.³ G01T *1/42, 1/00*
U.S. Cl. 250—355 **2 Claims**



1. An X-ray exposure control system for an X-ray diagnostic installation including an X-ray generator and an X-ray tube directing X-rays through the patient to an X-ray film, said exposure control system comprising in combination means providing kVp and mA settings for said X-ray generator, the kVp and mA settings affecting the exposure time required to

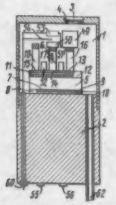
produce desired images on said film, an ion chamber including a plurality of selectively energizable ironizable fields for monitoring the amount of radiation provided to an X-ray film by said X-ray generator, and said ion chamber fields being electrically coupled to said X-ray generator selectively terminating the output of said X-ray generator, electronic circuitry for monitoring and controlling the time of operation of said X-ray generator, said circuit receiving a first voltage proportional to the kVp being applied to the associated tube, means for providing a reference voltage, means for combining said first voltage with said reference voltage to provide a first control signal, means for combining a voltage proportional to a density selection factor to said first control signal to obtain a second control signal, means for obtaining a voltage dependent on the radiation impinging on the selected fields of said ion chamber and means for comparing the said dependent voltage with said second control signal to provide an output control signal to terminate the radiation from said X-ray generator, said ion chamber including a plurality of discrete fields which may be selectively energized, said fields comprising an emitter electrode extending over a limited area, a collector electrode of substantially the same size as said emitter electrode spaced from said emitter electrode, spacer material positioned between said electrodes and having apertures formed therein adjacent said fields to form air chambers, a second emitter electrode of substantially the same size as said collector electrode spaced from said collector electrode, the X-rays passing through said apertures ionizing the air thereon, and holes in said fields adjacent said apertures for balancing the ionizing potential.

4,230,945

DEVICE FOR DETECTING IONIZING RADIATION

Vladimir A. Meir, ulitsa Nalichnaya, 36, korpus 2, kv. 167; Alexei N. Zhukovsky, Serebristy bulvar, 24, korpus 4, kv. 374; Vladimir S. Ponomarev, ulitsa Stasovoi, 2, kv. 363, all of Leningrad; Vladimir G. Subbotin, ulitsa Vavilova 5, kv. 11, Dubna Moskovskoi oblasti; Jury P. Kharitonov, ulitsa 50-letia Komsomola, 19, kv. 44, Dubna Moskovskoi oblasti; Vladimir F. Kusniruk, ulitsa 50-letia Komsomola, 5, kv. 29, Dubna Moskovskoi oblasti; Lukyan I. Anatychuk, Sportivny proezd, 4, kv. 21; Anatoly P. Melnik, ulitsa Khudyakova, 1, kv. 50., both of Chernovtsy; Vladimir A. Skakodub, ulitsa Siltsiema, 5, kv. 76, and Alexandr D. Sokolov, ulitsa Lenina, 159, kv. 1, both of Riga, all of U.S.S.R.

Filed Apr. 24, 1978, Ser. No. 899,515
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 **15 Claims**



1. A spectrometer for detecting ionizing radiation comprising:

a vacuum chamber having an entrance window to pass the radiation therethrough;

a thermoelectric cooler formed by a set of Peltier elements, said thermoelectric cooler having a hot side and a cold side and being arranged within said vacuum chamber;

a heat conducting plate mounted on said cold side of said thermoelectric cooler;

a radiator mounted on said hot side of said thermoelectric cooler to remove heat therefrom;

a first set of Peltier elements, having a hot side and a cold side and being integral with said thermoelectric cooler, said hot side of said first set being in contact with said heat conducting plate, the Peltier elements of this first set being stacked so as to develop the minimum temperature conditions on said cold side of said first set;

a semiconductor detector mounted on said cold side of said first set of Peltier elements;

a second set of Peltier elements, having a hot side and a cold side and being integral with said thermoelectric cooler, said hot side of said second set being in contact with said heat conducting plate and the Peltier elements of this second set being stacked so as to develop the maximum refrigeration capacity conditions on said cold side of said second set;

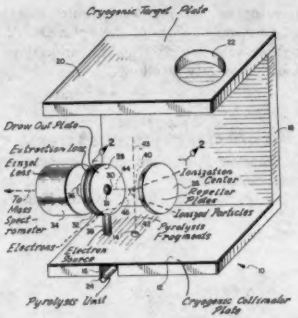
a field-effect transistor mounted on said cold side of said second set of Peltier elements.

4,230,946

CRYOGENIC COLLIMATOR APPARATUS AND METHOD

Gregory J. Wells, Murray, and Kent J. Voorhees, Bountiful, both of Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Mar. 19, 1979, Ser. No. 21,417
Int. Cl.[3] H01J *27/00*
U.S. Cl. 250—425 **7 Claims**



1. An improved ion source for a mass spectrometer wherein pyrolysis fragments from a pyrolysis unit are directed into an ionization center for ionization and the ionized particles of pyrolysis fragments are directed into the mass spectrometer for analysis, the improvement comprising a cryogenic means having an aperture therethrough, the cryogenic means being adapted to be placed adjacent the pyrolysis unit with the aperture in a direct line between the pyrolysis unit and the ionization center, the cryogenic means thereby holding pyrolysis fragments impinging thereon with the aperture collimating pyrolysis fragments from the pyrolysis unit into the ionization center.

4,230,947

APPARATUS FOR TREATING FLOWABLE MATERIAL

Robert D. Cram, Ipswich, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Filed Jul. 2, 1979, Ser. No. 54,002
Int. Cl.[3] G01N *23/00*
U.S. Cl. 250—434 **9 Claims**

1. An apparatus for treating flowable material by the irradiation thereof comprising in combination:

(a) a container for holding a quantity of such material including

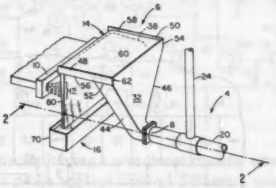
(1) a base portion having front, rear, left, and right edges, a rear section, and a front section, said rear section including front and rear end walls and convergent side

walls defining an open substantially wedge-shaped cavity, and said front section including a flat substantially rectangular ramp extending on an upward slant from the top of said front end wall to the front edge of said base; and

(2) vertical side walls rising from the left, right, and rear edges of said base, said side walls being appropriately connected to each other along the left-rear and right-rear corners thereby defined;

(b) inlet conduit means connecting the interior of said container with a source of material to be irradiated through the lower portion of said rear end wall;

(c) material delivery means associated with said inlet conduit means for delivering material to be irradiated through said inlet conduit means and into the interior of said container



at a predetermined rate selected so as to cause the material filling said container to flow over the front edge of said base portion as a thin, nonturbulent, cohesive layer without overflowing said vertical side walls;

(d) irradiation means disposed for directing at least one beam of radiation substantially perpendicularly onto the layer of material falling from the front edge of the base portion under the influence of gravity, said beam being moved back and forth across said layer at a speed much faster than that at which the material contained in said layer falls such that all material falling through the irradiation zone wherein the beam impinges upon the layer is substantially uniformly treated; and

(e) outlet reservoir means disposed to catch the material falling from the irradiation zone.

4,230,948

ARRANGEMENT FOR THE PRODUCTION OF X-RAY SECTIONAL PICTURES

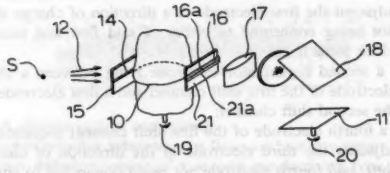
Eckhard Storck, and Ulrich Wolff, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,364

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743678

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—445 T **5 Claims**



1. An arrangement for the production of x-ray pictures, comprising an x-ray source for the production of x-rays which penetrate the object in at least one sectional plane, an x-ray screen which serves to convert the x-rays which have penetrated through into radiation to which a given recording medium is sensitive, a focusing optics by means of which each point of the screen is portrayed in the form of a line onto the recording medium, where points located beside one another are portrayed as lines located beside one another, and a rotation device by means of which the object and the x-ray source with the screen can be rotated relative to one another about an axis of rotation which is at right angles to the sectional plane, characterized by a recording medium which possesses a modulation transmission function having high-pass or band-pass filter characteristics.

4,230,949

TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES OF A RADIOGRAPHY SUBJECT

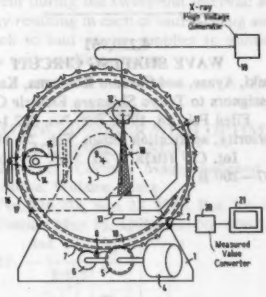
Walter Distler, Erlangen, and Karl-Georg Heinzelmann, Neunkirchen a. Brand, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 31, 1979, Ser. No. 44,057

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829179

Int. Cl.² A61B *6/00*

U.S. Cl. 250—445 T **6 Claims**

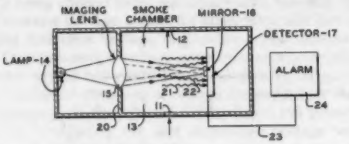


1. A tomographic apparatus for producing transverse layer images of a radiography subject, having a radiation measuring arrangement which comprises a radiation source producing a radiation beam which penetrates the radiography subject and whose cross sectional extent perpendicular to the layer plane is equal to the layer thickness, and also a radiation receiver which determines the radiation intensity behind the subject, a movable support carrying the measuring arrangement and displaceable parallel to the plane of the layer, a rotating track carrying the movable support, and motor means for driving the rotating track for irradiating the radiography subject from various directions and for driving the movable support, and a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, characterized in that a ring (**10**) is rotatably mounted on a common axis with the rotating track (**2**) and is driven by the motor means (**4**) for a continuous rotation of said ring (**10**), and a step by step drive unit (**6, 7, 8**) energized by the motor means (**4**) and driving said rotating track, a gear wheel (**14**) being rotatably mounted on the rotating track (**2**) and being driven by said ring (**10**), and crank means (**15**) driven by said gear wheel (**14**) for effecting movement of said movable support.

4,230,950
ELECTRO-OPTIC SMOKE DETECTOR

John A. Forss, Excelsior, and Tzuo-Chang Lee, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 16, 1979, Ser. No. 39,467
Int. Cl.[3] G08B 17/10
U.S. Cl. 250—574 8 Claims

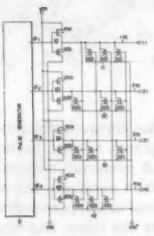


1. Optical smoke detector apparatus comprising:
a smoke sensing chamber having air inlet and outlet means;
an optical sensor in said chamber having a face comprising a light receiving portion and a light reflecting portion, said light receiving portion being of a relatively large area with respect to said light reflecting portion;
light source means in said apparatus;
means directing the light from said source substantially onto said light reflecting portion and minimally onto said light receiving portion, whereby the light directed on said light reflecting portion is reflected generally back towards said source without falling on said light receiving portion;
and whereby in the presence of smoke in said chamber light is scattered thereby, and falls on said light receiving portion to indicate the presence of said smoke.

4,230,951
WAVE SHAPING CIRCUIT

Yasoji Suzuki, Ayase, and Susumu Kouyama, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Feb. 28, 1978, Ser. No. 882,147
Claims priority, application Japan, Feb. 28, 1977, 52-21366
Int. Cl.[2] H03K 1/10, 5/08, 17/16
U.S. Cl. 307—200 B 11 Claims

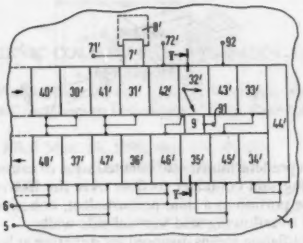


1. A wave shaping circuit comprising:
a plurality of signal lines connected to receive a plurality of clock signals having different phases and apply the clock signals to a capacitive active device, each of said clock signals having an active level to activate the capacitive active device and a non-active level;
a plurality of switching circuits connected between a reference potential point and said signal lines, each of said switching circuits having a control signal input means connected to at least one of said signal lines adjacent to that one of the signal lines to which said each of said switching circuits is connected, wherein a switching circuit connected through the control signal input means to a signal line receiving an active level clock signal is rendered conductive and drives said adjacent signal line to the reference potential point.

4,230,952
REGENERATOR CIRCUIT FOR CCD ARRANGEMENTS IN A MULTI-LAYER METALLIZATION STRUCTURE

Karl Knauer, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 725,551, Sep. 22, 1976, abandoned. This application Jun. 2, 1978, Ser. No. 912,094
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542832
Int. Cl.[2] G11C 19/28; H01L 29/78
U.S. Cl. 307—221 D 3 Claims

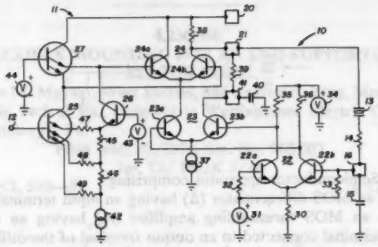


1. A regenerator system in a charge coupled device loop for removing leakage current produced charges and echo signals produced by incomplete transfer of signal charge between storages areas, comprising:
(a) first and second spaced apart charge shift channels with a connecting electrode connecting the channels to each other at one end;
(b) each channel having a substrate and charge shift electrodes forming shift elements above the substrate;
(c) first and second clock pulse lines connecting to the shift electrodes;
(d) a first regenerator electrode arranged at a side of the first shift channel next to a first electrode of the first shift channel;
(e) a diffusion zone of first conductivity type opposite a second conductivity type of the substrate at a side of the first regenerator electrode on a surface of the substrate, said diffusion zone laterally extending to the first regenerator electrode;
(f) a second electrode of the first shift channel sequentially adjacent the first electrode in a direction of charge shift not being connected to either of said first and second clock pulse lines;
(g) a second regenerator electrode lying between a third electrode of the first shift channel and a first electrode of the second shift channel;
(h) a fourth electrode of the first shift channel sequentially adjacent the third electrode in the direction of charge shift, said fourth electrode not being connected to either of said first and second clock pulse lines;
(i) first potential means periodically connected to the second regenerator electrode for transferring a portion of charge of magnitude corresponding to the echo to the second shift channel first electrode; and
(j) second potential means periodically connected to the fourth electrode for retaining said portion of charge beneath the third electrode.

4,230,953
NON-LINEAR CONTROL CIRCUIT

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 819,746, Jul. 28, 1977, Pat. No. 4,132,964.
This application Jul. 31, 1978, Ser. No. 929,872
Int. Cl.[3] H03F *3/45, 1/10, 1/32*
U.S. Cl. 307—230 4 Claims



1. A control circuit having a non-linear transfer characteristic as a function of an applied control potential, said circuit comprising:

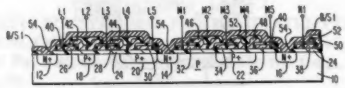
a differential amplifier stage having a differential control input, a common mode input, and an output; and

a differential control stage having a differential output coupled to said control input of said differential amplifier stage, and a differential input, said differential control stage including a pair of transistors each constructed so as to have substantially different characteristics whereby the signal transfer characteristic from said common mode input to said differential amplifier stage output is a non-linear function of said potential applied to said input of said differential control stage.

4,230,954
PERMANENT OR SEMIPERMANENT CHARGE TRANSFER STORAGE SYSTEMS

Lawrence G. Heller, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,409
Int. Cl.[3] H03K *5/00;* H01L *29/78;* G11C *11/34;* H01L *29/34*
U.S. Cl. 307—238 18 Claims



1. A storage system comprising:

a semiconductor substrate of a first conductivity type;

a first diffusion region of a second conductivity type disposed within said substrate;

a plurality of adjacent devices coupled to said substrate having different threshold voltages and disposed adjacent to said diffusion region;

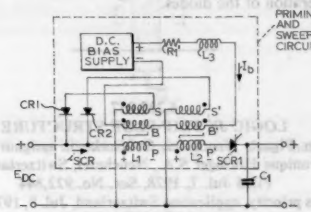
means for transferring charge from said diffusion region to each of said devices; and

means coupled to said diffusion region for selectively detecting charge stored in said devices.

4,230,955
METHOD OF AND APPARATUS FOR ELIMINATING PRIMING AND CARRIER SWEEP-OUT LOSSES IN SCR SWITCHING CIRCUITS AND THE LIKE

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Apr. 6, 1978, Ser. No. 893,966
Int. Cl.[3] H03K *17/72, 17/292*
U.S. Cl. 307—252 J 11 Claims

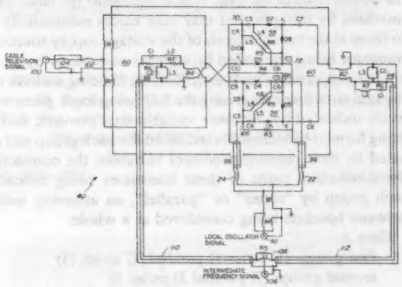


1. A method of eliminating priming and carrier sweep-out losses in SCR switching circuits associated with power supplies and in which energy is stored in response to SCR switching in such circuits, said method comprising delaying the rise of SCR current upon such switching for a predetermined priming interval, thereby also generating additional minority carriers in the SCR; limiting the current during the priming interval; generating a reverse voltage to effect sweep-out of such minority carriers during a sweep-out interval, limiting the current during the sweep-out interval; and transferring the energy resulting in each of said priming and sweep-out intervals back to said power supplies to eliminate heat dissipation of the said resulting energy.

4,230,956
DOUBLY BALANCED MIXER WITH OPTIMIZED DYNAMIC RANGE

Donald H. Steinbrecher, Carlisle, Mass., assignor to Steinbrecher Corporation, Woburn, Mass.

Division of Ser. No. 725,714, Sep. 23, 1976, Pat. No. 4,112,374.
This application May 15, 1978, Ser. No. 906,214
Int. Cl.[3] H03K *17/74*
U.S. Cl. 307—257 5 Claims



1. A circuit comprising:

(a) a source of an RF signal,

(b) means for dividing the rf signal into a pair of balanced equal current components,

(c) first and second diode bridge means coupled to the dividing means such that during one polarity of the rf signal the first diode bridge means is forward biased and forms a conductive path, for both current components and the second diode bridge means is reverse biased and such that

during the other polarity of the rf signal the second diode bridge means is forward biased and forms a conductive path for the current components and the first diode bridge means is reverse biased, and

(d) means for providing matched termination for each of the current components of the rf signal during each polarity of the rf signal, and

(e) means for coupling all diodes of each bridge in series with respect to each other with respect to the average dc current component of the rf signal to enhance the matched operation of the diodes.

4,230,957

LOGIC JK FLIP-FLOP STRUCTURE

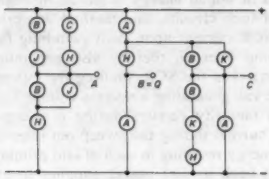
Christian Piguet, Neuchatel, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Jul. 7, 1978, Ser. No. 922,844

Claims priority, application Switzerland, Jul. 8, 1977, 8474/77

Int. Cl.³ H03K *3/286, 3/353, 19/094, 19/20*

U.S. Cl. 307—279 **13 Claims**



1. A logic bistable JK flip-flop structure capable of being realized in integrated circuit technology with complementary MOS transistors, comprising at least three logic gates each of which comprises a first group of transistors of a first conduction type and a second group of transistors of a second conduction type, these two groups of transistors being connected in series across the terminals of a voltage supply source and their common connection point forming the output node of the gate, the conduction paths of the transistors of each group being connected in series and/or in parallel with each other, so that the conduction state of these transistors define the potential at the output node of the gate, which represents the inner variable provided by this gate and may take values substantially equal to those at the two terminals of the voltage supply source, each transistor being controlled by an inner variable or by an external control variable such as J, K or H, H being a clock signal, the said structure comprising the following logic gates, respectively indicated by the inner variable they provide, said gates being formed by transistors indicated for each group and designated by their respective control variables, the connection of the conduction paths of these transistors being indicated in each group by "series" or "parallel", an assembly indicated between brackets being considered as a whole:

Gate A:

first group: (B series J) parallel (C series H)

second group: (B parallel J) series H

Gate B:

first group: A series H

second group: A

Gate C:

first group: A series (B parallel K)

second group: (B series K series H) parallel A,

the transistor controlled by A in the first groups of the gates B and C being preferably common to these gates and the output variable Q of the circuit being the variable B.

4,230,958

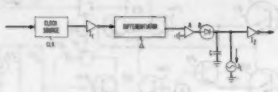
LOSS OF CLOCK DETECTOR CIRCUIT

Harry J. Boll, Berkeley Heights, and Michael K. Maul, Whitehouse Station, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1978, Ser. No. 932,266

Int. Cl.³ H03K *5/19*

U.S. Cl. 307—353 **9 Claims**



1. Semiconductor apparatus comprising:

(a) an MOS differentiator (Δ) having an input terminal;

(b) an MOS thresholding amplifier (A) having an input terminal connected to an output terminal of the differentiator (Δ);

(c) an MOS unidirectional current inhibitor (D) having an input terminal connected to an output terminal of the amplifier (A);

(d) an MOS storage capacitor (C) having one terminal connected to an output terminal of the inhibitor (D);

(e) a leakage current source (J_L) connected to said one terminal for providing a leakage current thereto if and only if the charge on said terminal is above a threshold, said inhibitor (D) directed for delivering charge in a direction tending to charge said one terminal and said leakage current being in a direction tending to discharge said one terminal; whereby the voltage level at said one terminal is a binary indication of whether or not clock pulse voltage is being applied to the input terminal of the differentiator (Δ).

4,230,959

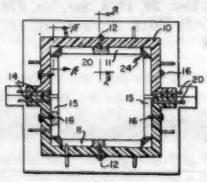
MAGNETOHYDRODYNAMIC (MHD) CHANNEL CORNER SEAL

Francis R. Spurrier, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1979, Ser. No. 18,099

Int. Cl.³ H02K *45/00*

U.S. Cl. 310—11 **8 Claims**



1. In a magnetohydrodynamic channel including an elongated duct, rectangular in cross section, which defines a passageway for an electrically conducting working fluid and which has electrodes and insulators extending transversely across opposed faces of the channel said insulators being disposed between the electrodes said electrodes being supported from the duct at midpoints along their length, the improvement comprising seals disposed in the corners of the duct and extending the length of the channel to impede leakage of work-

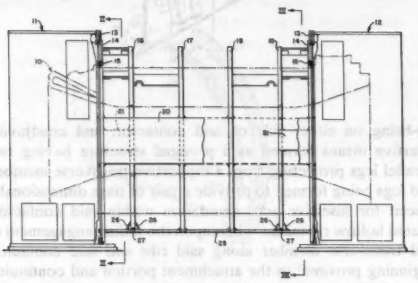
ing fluid along the corners of the duct, said seals including a compressible portion which contacts the duct and an insulating portion which contacts the electrodes and insulators, said insulating portion being segmented into pieces of the same thickness as the electrodes and insulators and aligned therewith, the pieces aligned with the insulators being of a different size from the pieces aligned with the electrodes to create a stepped configuration along the corners of the duct.

4,230,960

FLEXIBLE MOUNTING FOR AN END-SUPPORTED STATOR CORE

James M. Mayher, West Mifflin, and Andrew S. Ying, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1978, Ser. No. 965,007
Int. Cl.³ H02K 5/24
U.S. Cl. 310—51 **8 Claims**



1. A flexible mounting for an end-supported stator core in a dynamoelectric machine comprising the combination of:

a plurality of bore rings encircling the stator core at coaxially, spaced-apart locations therealong,

an end box disposed at each end of the stator core,

outer and inner springs extending independently at each exterior side of the stator core within the horizontal center plane thereof to independently interconnect the bore rings with the end boxes, said springs defining a resiliency radially of the stator core to isolate double-frequency core vibration and a stiffness tangentially to the stator core to resist a short-circuit torque, each outer spring being joined to a bore ring disposed axially between other bore rings, and each inner spring being joined to a bore ring at one end of the stator core, and

a stabilizer joined to the bore rings and extending between the end boxes below the stator core within the vertical central plane thereof.

4,230,961

MAGNETIC FLUX SENSOR FOR LAMINATED CORES

Raymond M. Calfo, Pittsburgh, and Arthur Mulach, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1978, Ser. No. 941,616
Int. Cl.³ H02K 11/00
U.S. Cl. 310—68 R **4 Claims**

1. In combination: a magnetic core comprising a plurality of laminations clamped together under pressure;

flux sensing means embedded in said core, said sensing means comprising a flat, multi-turn coil located between two adjacent ones of said plurality of laminations and parallel to the plane of said laminations proximate the end region of the core in a position to sense axial magnetic flux, said coil having no magnetic material extending through the turns thereof, said coil having flat conductive leads extending therefrom and between said two adjacent laminations to the exterior of said magnetic core;

means for insulatively enclosing said coil and for supporting the pressure contact of said adjacent laminations, said

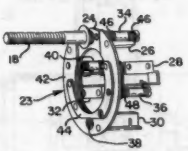
means having a total thickness greater than that of said coil.

4,230,962

BRUSH PLATE ASSEMBLY

Edward E. Cards, 5540 Robbins Ave., Portage, Ind. 46368

Filed Aug. 11, 1978, Ser. No. 932,809
Int. Cl.³ H02K 13/00
U.S. Cl. 310—239 **3 Claims**



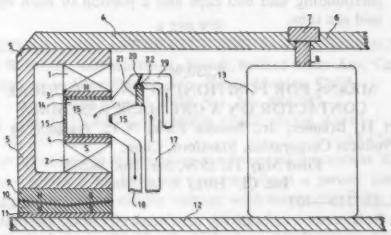
1. An improved brush plate assembly for use in a direct current operated starter motor comprising; a brush plate having a plurality of brush holders secured to said brush plate; an elongated stud member removeably secured to said brush plate and acting to provide electrical communication between a direct current source and said brush plate; and at least one threaded screw acting to secure one of said brush holders to said brush plate and to removeably secure said stud member to said brush plate by extending into holes formed in said one of said brush holders, said brush plate and said stud member.

4,230,963

HYDRO-THERMIC ENERGY CONVERTER

Waldemar H. Kurpanek, Mercatorstr. 3, D-4000 Duesseldorf-11, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 867,971
Int. Cl.³ H01J 45/00
U.S. Cl. 310—306 **10 Claims**



1. A hydro-thermic energy converter capable to convert

energy contained in hot water in mechanical energy comprising, a ring-shaped stator unit consisting of a radially arranged chamber system with ferromagnetic chamber plates of a low Curie-point and a(in-) inlet and an outlet tubing system with valves and vent pipe to permit a flushing of the chamber system with hot (and) or cool water thus permitting alternate heating (and) or cooling the said ferromagnetic chamber plates respectively above (and) or below (their) the Curie-point and that furthermore a rotor system consisting of at least one rotatable mounted rotor arm (with) on which magnets are arranged such that a directional magnetic field is established between which the stator unit slides thus generating a rotational force without contacting the magnets.

4,230,964

COLOR HIGH-PRESSURE SODIUM VAPOR LAMP

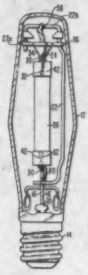
Ranbir S. Bhalla, West Paterson, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,597

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.³ H01J *61/36*

U.S. Cl. 313—220 **6 Claims**



1. A high-pressure sodium vapor discharge lamp including an outer envelope sealed to a standard base and an arc tube having a tubular polycrystalline alumina or sapphire body mounted within said outer envelope by a mounting frame, which is electrically connected to said base, said discharge lamp further comprising:

a refractory metal end cap sealed to each end of the arc tube body, each of said end caps including a silicon coating on the interior surface thereof and a glassy sealing frit principally comprising alumina and calcia interposed between said silicon coating and said arc tube body,

a discharge sustaining electrode mounted to each of said end caps, said discharge sustaining electrodes spaced a predetermined distance from each other,

a discharge sustaining fill within said arc tube body, said discharge sustaining fill principally comprising a sodium-mercury amalgam of predetermined proportions; and

cylindrical heat shields mounted to said mounting frame and surrounding said end caps and a portion of each end of said arc tube.

4,230,965

MEANS FOR POSITIONING AN ELECTRICAL CONTACTOR ON A CRT MASK ASSEMBLY

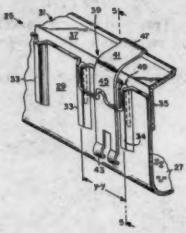
Kurt H. Brenner, Jr., Seneca Falls, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 11, 1979, Ser. No. 38,356

Int. Cl.³ H01J *9/18, 29/07*

U.S. Cl. 313—407 **8 Claims**

1. Relative to a cathode ray tube mask electrode assembly, of the type spatially located within the viewing panel of a CRT, and constructionally including a multi-opening areal component peripherally attached to a rigid framing member, a combination of cooperating means for positioning a forwardly-directed resilient mask-panel electrical contactor having a flexural portion with an integral attachment portion affixed to said mask assembly to effect selective temporary retractive positioning of said electrode contactor at a placement substantially contiguous with the side of said mask assembly, said combination of cooperating contactor positioning means comprising: receiving means in the form of at least two parallel open-ended hollow-rib means integrally oriented in spaced apart relationship on the side of said mask assembly with one



rib-being on either side of said contactor; and coadjuvant insertive means formed as a pronged structure having two parallel legs projecting from a supportive transverse member, said legs being formed to provide a pair of tines dimensionally spaced for insertive accommodation within said contactor-related hollow rib means whereupon the sliding engagement of said transverse member along said ribs and said contactor, beginning proximal to the attachment portion and continuing along the flexural portion thereof, effects retractive placement of said contactor.

4,230,966

METAL STRIP ATTACHED TO HIGH VOLTAGE CONTACT WITH GETTER AT ONE END AND CONTACT TO SHIELD CONE AT THE OTHER

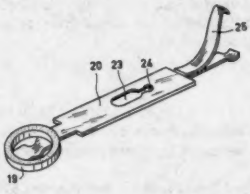
Johannes M. A. A. Compen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,330

Claims priority, application Netherlands, Nov. 18, 1977, 7712707

Int. Cl.³ H01J *29/07, 29/84*

U.S. Cl. 313—481 **2 Claims**



1. A colour television display tube comprising an envelope having a neck, a cone portion and a window portion, an electrode system positioned in said neck for generating at least two electron beams, a display screen provided on the interior surface of said window portion, a colour selection electrode positioned in said envelope adjacent said display screen, a magnetic screening cone secured to said color selection electrode and extending within the cone portion towards said neck, said screening cone being electrically connected to said colour selection electrode, a resistive layer provided on an internal wall portion of the envelope between said electrode system

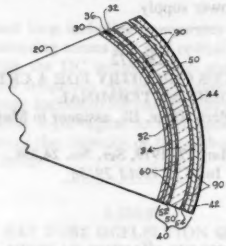
and said display screen, a high voltage contact extending through said envelope at a position between said electrode system and said display screen and being connected electrically to said resistive layer, a getter and a metal strip having one end affixed to said getter for securing said getter to said high voltage contact, said strip being attached to said high voltage contact and having on the other end a metal spring in electrical contact with said screening cone to thereby electrically connect said screening cone and said colour selection electrode to said high voltage contact and said resistive layer.

4,230,967

CATHODE RAY TUBE WITH TOUCH-SENSITIVE DISPLAY PANEL

George E. Holz, North Plainfield; James A. Ogle, Neshanic Station, and George J. Przybylek, Warren, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 28, 1978, Ser. No. 928,959
Int. Cl.³ H01J *29/26;* H01G *7/00*
U.S. Cl. 315—3 **5 Claims**



1. A touch panel assembly comprising
an insulating plate having an outer surface and an inner surface,
a plurality of narrow column conductors on said outer surface and a column of first relatively large-area transparent electrodes disposed adjacent to each of said column conductors, said first electrodes also being aligned in rows,
interleaved means intimately coupling each column conductor to the column of first large-area electrodes adjacent to it,
a plurality of rows of second large-area transparent electrodes on the inner surface of said plate, each second electrode lying beneath a first electrode on the outer surface and being capacitively coupled thereto, and
a narrow row conductor extending along and coupling together the second electrodes in each row on said inner surface.

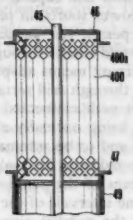
4,230,968

CATHODE STRUCTURE FOR MAGNETRONS

Tomokatsu Oguro, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 799,546, May 23, 1977. This application Feb. 7, 1979, Ser. No. 10,311
Claims priority, application Japan, May 26, 1976, 51-60048; Jun. 2, 1976, 51-63601; Jun. 25, 1976, 51-74370
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.51 **15 Claims**

1. In a magnetron of the type including a cathode structure and an anode structure surrounding the cathode structure, wherein said cathode structure includes a filament, upper and lower end shields secured to the opposite ends of the filament for supporting the same, and a center support and a side support respectively supporting said upper and lower end shields and also acting as electric leads, the improvement comprising:
a filament in the form of a metallic cylindrical body provided with a plurality of openings therethrough;
said upper and lower end shields further including upper and lower cylindrical cups having the openings thereof facing each other for receiving the cylindrical filament



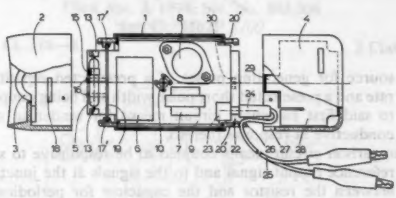
and wherein the opposite ends of the cylindrical filament are contained within and supported by the cylindrical cups.

4,230,969

IGNITION TIMING TESTING DEVICE

Mogens D. Nieuwenhuis, Amsterdam, and Raymond Van Bracht, Veld, both of Netherlands, assignors to Aquapro A.G., Switzerland

Filed Jun. 5, 1979, Ser. No. 45,737
Claims priority, application Netherlands, Jun. 5, 1978, 7806096
Int. Cl.³ H05B *41/34*
U.S. Cl. 315—241 S **7 Claims**



1. Device for stroboscopically testing the ignition timing of an internal-combustion motor, comprising a casing of flat elongate shape including a middle casing part, a rear casing part and a front casing part removably attached to said middle casing part, a flash lamp of the ionised-gas type having a triggering electrode, means for exchangeably mounting said flash lamp at the forward end of said middle casing part, trigger circuit means for said flash lamp arranged in said middle casing part, said front casing part having an opening in its forward side and a lens mounted in said opening in front of said flash lamp, and a metal antenna member mounted inside said rear casing part and operatively connected to said trigger circuit means so as to control said latter means to trigger said flash lamp in response to impulses received by said antenna means from the ignition system of the motor being tested.

4,230,970

METHOD AND APPARATUS FOR SAVING ENERGY

Gene B. Potter, and Martin H. Jurick, both of Santa Ana, Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

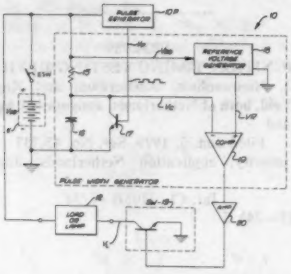
Filed Mar. 7, 1978, Ser. No. 884,147
Int. Cl.³ G05F *1/00;* H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—307 **12 Claims**

1. Apparatus for maintaining a substantially constant RMS voltage across a load device powered from a power source having a decreasing output voltage with time comprising
means adapted to be coupled to said power source in parallel circuit relationship for providing a reference output voltage signal that has an inverse relationship to the voltages

of the power source and with a substantially constant slope,

a serial resistor-capacitor network having a junction between the resistor and capacitor and adapted to be coupled to said power source in parallel circuit relationship therewith to permit the capacitor to be exponentially charged from said source through the resistor,

first switching circuit means adapted to be coupled to said power source through said serial resistor and including a parallel circuit path connected to opposite sides of the capacitor and being normally arranged in a nonconductive condition and to be automatically rendered conductive at preselected time intervals for discharging the capacitor by means of the parallel circuit path during the conductive time intervals of the parallel circuit path, the time intervals the parallel circuit path is conductive is short relative to the nonconductive time intervals, pulse generating means adapted to be coupled to said power



source for generating pulses of a preselected repetition rate and a preselected short pulse width and being coupled to said first switching circuit means for rendering said conductive in response thereto,

comparison circuit means coupled to be responsive to said reference output signal and to the signals at the junction between the resistor and the capacitor for periodically providing output pulses having pulse widths that vary as the inverse square of the output voltages from said source only when the signals at said junction are less than the amplitude of the reference output signals, and

second switching circuit means coupled to be responsive to the output pulses from said comparison circuit means to be rendered conductive thereby for the time duration of said output pulses, and a load device adapted to be coupled to said power source to be powered therefrom through the second switching circuit means during the time intervals the second switching means is rendered conductive in response to said output pulses.

4,230,971

VARIABLE INTENSITY CONTROL APPARATUS FOR OPERATING A GAS DISCHARGE LAMP

Francis H. Gerhard, San Juan Capistrano, and Gerald A. Felper, Anaheim, both of Calif., assignors to Datapower, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 865,209, Dec. 28, 1977, Pat. No. 4,168,453. This application Sep. 7, 1978, Ser. No. 940,435

Int. Cl.³ H05B *41/39*

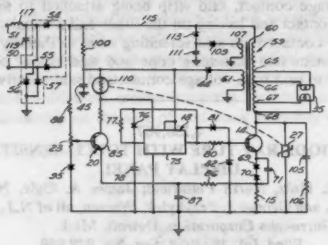
U.S. Cl. 315—307 **18 Claims**

1. A circuit for energizing a gas discharge lamp comprising:

first means for storing magnetic energy connected in parallel combination with the electrodes of the gas discharge lamp;

second means for connecting a rectified AC power supply to said parallel combination;

third means operatively coupled to said second means for interrupting the connection between said power supply and said parallel combination for a predetermined length of time, shorter than the period of said AC power supply, whenever the current through said parallel combination has increased to a predetermined level; and



fourth means for programming said predetermined level to vary in accordance with the varying AC voltage of said rectified AC power supply.

4,230,972

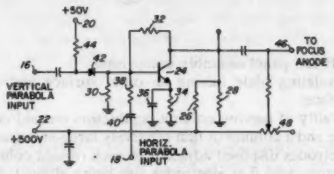
DYNAMIC FOCUS CIRCUITRY FOR A CRT DATA DISPLAY TERMINAL

Michael P. Bafaro, Park Ridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 27, 1979, Ser. No. 24,359

Int. Cl.³ H01J *29/58*

U.S. Cl. 315—382 **3 Claims**



1. In a cathode ray tube device requring high resolution as for data display, the combination comprising:

means for supplying an electron beam;

focusing means positioned to focus said electron beam;

high voltage supply means coupled to the focusing element for supplying an adjustable DC focus voltage;

first circuit means coupled to the focusing element for supplying a signal having a parabolic waveform at the vertical frame rate;

second circuit means coupled to the focusing element for supplying a second signal having a parabolic waveform at the horizontal line rate; and

circuit means coupled to the focusing element for multiplying the output signals of the first and second circuit means to provide a dynamic focusing voltage.

4,230,973

DC COUPLED, WIDE BAND WIDTH HIGH VOLTAGE MODULATOR

Robert H. Bickley, Scottsdale, and Michael J. Dewey, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1979, Ser. No. 34,218

Int. Cl.³ H01J *29/52*

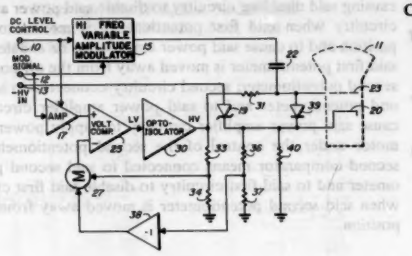
U.S. Cl. 315—383 **13 Claims**

1. A modulator for controlling the intensity of a display on a cathode ray tube by means of signals including a DC intensity level component and AC components, said modulator comprising:

(a) monitoring means associated with the cathode ray tube

for sensing control voltages applied to the cathode ray tube;

(b) optical isolator means having a relatively low voltage, control input signal and a relatively high voltage control output signal coupled to the cathode ray tube for producing a desired intensity; and



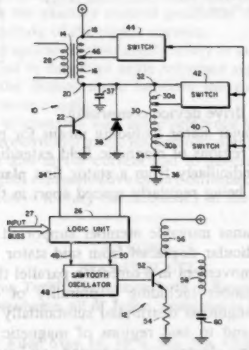
(c) a control loop including comparator means coupled to said monitoring means and said optical isolator means for comparing the DC intensity level component and relatively low frequency AC components to the sensed control voltage applied to the cathode ray tube and supplying the control input signal to said optical isolator means maintaining the intensity of the cathode ray tube at the desired level.

4,230,974

CATHODE RAY TUBE DEFLECTION CIRCUIT HAVING DISPLAY FORMAT SELECTION

Gary R. Haak, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 16, 1979, Ser. No. 30,256
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—399 **4 Claims**



1. An apparatus for selectively changing the display on the screen of a cathode ray tube from a first format to a second format in response to a format control signal including a horizontal deflection circuit **10** having an inductance **16, 30** with a first inductive value resonated with a capacitor **37** to a first horizontal sweep frequency, means **26** for generating a horizontal drive signal **24** in response to the format selection signal for driving the horizontal deflection circuit **10**, the horizontal deflection circuit **20** determining the horizontal size of the display, means **26, 40, 42, 44**, responsive to the control signal **27**, for changing the inductive value of said inductance **16, 30** to a second value and thus changing the resonant frequency of the horizontal deflection circuit to a second value, means **26** responsive to the control signal **27**, for changing the frequency of said horizontal drive signal to a second frequency related to the second resonant frequency of the horizontal deflection circuit **10**, and a vertical deflection circuit **12** including means **26** responsive to the format control signal for varying the amplitude of the output of the vertical deflection circuit from a first value to a second value

CHARACTERIZED BY:

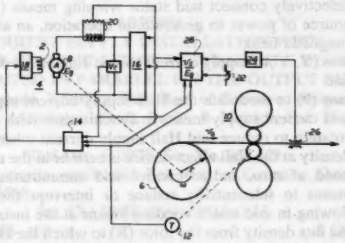
said horizontal deflection circuit inductance **16, 30** including a yoke **30** and said inductive value changing means **26, 40, 42, 44** including a switch **40, 42** for effectively shorting at least a portion of the turns of said yoke **30** so as to reduce the inductance of the yoke **30**.

4,230,975

CONTROL CIRCUIT ARRANGEMENT FOR DC MOTORS

Paul C. Donatelli, Trafford, Pa., and Kenneth G. Main, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 893,006
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—6 **3 Claims**



1. A method of providing constant tension on a strip of material being wound on or unwound from a coil of material driven by the armature of a DC motor, the method comprising the steps of

supplying the armature with electrical power,

measuring a physical characteristic of the material being wound or unwound,

utilizing this measurement to establish a predetermined level of current flow in the circuit of the armature,

continuously measuring the voltage across the armature of the motor, continuously measuring the rate of travel of material being wound or unwound, and developing from the combination thereof a counter voltage for the field of the motor that functions to offset changes in the voltage of the armature,

continuously directing said counter voltage to the field, and

increasing the current in the armature by an amount corresponding to the reduction of armature voltage when the speed of rotation of the armature is decreased to the extent that the field of the motor becomes saturated, the increase in armature current being effective to maintain the power output of the motor constant, and thus provide constant tension on the strip of material being wound or unwound from the coil driven by the motor.

4,230,976

BRUSHLESS, PERMANENT MAGNET D-C MOTOR WITH IMPROVED COMMUTATION CONTROL

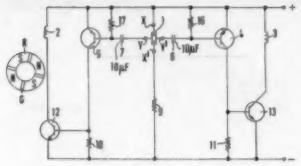
Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 879,143, Feb. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 627,130, Oct. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 527,345, Nov. 26, 1974, Pat. No. 3,986,086, which is a division of Ser. No. 363,290, May 23, 1973, Pat. No. 3,873,897. This application May 25, 1979, Ser. No. 42,362

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804561

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—138 32 Claims



1. Brushless d-c motor comprising a permanent magnet rotor (R) and stator winding means (2, 3, 110) and a Hall effect device (1) positioned to be controlled by magnetic flux from said permanent magnet rotor, the magnitude and direction of said flux being rotor position dependent, said Hall effect device providing in operation two output signals at its outputs,

electrical commutating device means connected to be controlled by the output signals of said Hall effect device to selectively connect said stator winding means (2, 3) to a source of power to generate, in operation, an alternating magnetic field,

means (Y, Y')to supply current to said Hall effect device (1), and

means (9) to modulate the Hall supply current supplied by said current supply means in synchronism with the rotor rotation to reduce said Hall supply current when the flux density at the Hall effect device is zero or in the neighborhood of zero, and to control said commutating device means to substantially reduce or interrupt the current flowing in said stator winding means at the instant when the flux density from the rotor (R) to which the Hall effect device is exposed is zero or in the neighborhood of zero.

4,230,977

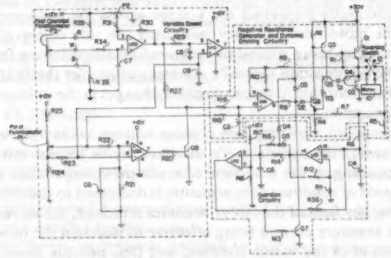
SPEED CONTROL FOR ELECTRIC MOTOR

David A. Nelson, 22031 Dumetz Ave., Woodland Hills, Calif. 91364

Filed Jul. 3, 1978, Ser. No. 921,771

Int. Cl.[3] H02P *5/06*

U.S. Cl. 318—305 7 Claims



1. A speed control system for an electric motor comprising: a first potentiometer; first circuitry connected to said first potentiometer; power amplifier circuitry connected to said first circuitry to supply power to the motor under control of said first potentiometer; disabling circuitry included in said power amplifier circuitry; a first comparator means connected to said first potentiometer and to said disabling circuitry for causing said disabling circuitry to disable said power amplifier circuitry when said first potentiometer is moved to an off position and to cause said power amplifier to be enabled when said first potentiometer is moved away from the off position; a second potentiometer; second circuitry connected to said second potentiometer and to said power amplifier circuitry to cause said power amplifier circuitry to supply power to the motor under the control of the second potentiometer; and second comparator means connected to said second potentiometer and to said first circuitry to disable said first circuitry when said second potentiometer is moved away from an off position.

4,230,978

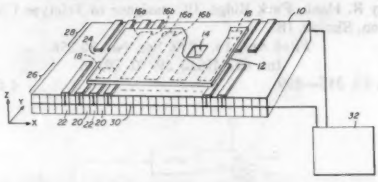
IMPULSE DRIVE SYSTEM

John F. Gardella, Jr., Bedford; George W. King, Concord; Eric A. Kolm, Brookline, and Henry H. Kolm, Wayland, all of Mass., assignors to Compugraphic Corporation, Wilmington, Mass.

Filed Feb. 24, 1978, Ser. No. 881,024

Int. Cl.[3] G05B *11/00*

U.S. Cl. 318—687 44 Claims



1. An impulse drive device comprising

a generally planar stator including means for producing a plurality of regions of magnetic field extending substantially perpendicularly from a stator first planar surface, said regions being regularly spaced apart in the plane of said stator,

a generally planar movable member supported parallel to and perpendicular displaced from said stator first planar surface for movement in a direction parallel thereto, said movable member including a plurality of electrically conductive segments distributed substantially parallel to each other and to said regions of magnetic field, said segments being electrically connected and having a spacing between immediately adjacent segments in the plane of said movable member substantially equal to the spacing of said regions of magnetic field; and

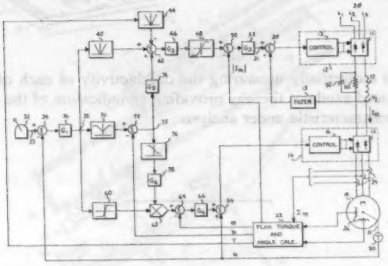
pulse sequence generating means for generating sequences of current pulses and for delivering the same to said plurality of electrically conductive segments so that the passage of current pulses through each of said plurality of segments interacts with adjacent ones of said plurality of regions of magnetic field to generate motion of said movable member parallel to the plane of said stator from any of a plurality of predetermined initial positions of said movable member with respect to said stator to any of a plurality of predetermined final positions of said movable member with respect to said stator.

4,230,979

CONTROLLED CURRENT INVERTER AND MOTOR CONTROL SYSTEM

Paul M. Espelage, Ballston Lake, N.Y.; Loren H. Walker, Salem, Va., and William G. Wright, deceased, late of Schenectady, N.Y. (by Mary Nobel Wright, executrix), assignors to General Electric Company, Salem, Va.

Filed Apr. 10, 1978, Ser. No. 895,189
Int. Cl.[2] H02P 5/28, 3/18, 7/36
U.S. Cl. 318—721 25 Claims



1. A control for an a.c. electric motor having a stator and a rotor spaced from the stator by a gap across which gap flux is produced in response to an electrical motor current of variable magnitude and frequency through windings associated with said stator, said control serving to control the electrical torque of said motor and comprising:

(a) means to determine, with respect to the motor, the instantaneous electrical torque and the instantaneous angle between the gap flux and the motor current and to provide signals proportional thereto;

(b) means to establish a torque reference signal proportional to a desired level of electrical torque;

(c) means to compare said torque reference signal with said signal proportional to the instantaneous electrical torque and to generate a current error signal representative of any difference therebetween, said current error signal acting as the primary control parameter serving to vary the magnitude of the motor current;

(d) means responsive substantially solely to said torque reference signal to derive an angle reference signal representative of the desired angle between the gap flux and the motor current; and,

(e) means to compare said angle reference signal with said signal proportional to the instantaneous angle between the gap flux and motor current and to generate a frequency error signal representative of any difference therebetween and effective to vary the frequency of the motor current.

4,230,980

BIAS CIRCUIT

Yoshiaki Sano; Toshio Hanazawa, both of Kawasaki, and Hideo Honda, Yokohama, all of Japan, assignors to Fujitsu Limited, Japan

Filed May 18, 1979, Ser. No. 40,406
Claims priority, application Japan, May 24, 1978, 53-61927
Int. Cl.[3] G05F 3/20
U.S. Cl. 323—19 12 Claims

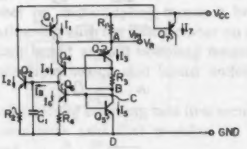
1. A bias circuit, having a d.c. supply terminal, a bias output terminal, and a reference potential terminal, comprising:

first and second elements arranged in series between the bias output terminal and the reference potential terminal of said bias circuit, said first and second elements generating a voltage between the bias output terminal and the reference potential terminal, said voltage being equal to the sum of two voltage drops in a forward p-n junction;

first and second transistors connected in series, the collectors of said first and second transistors being connected at a node, each of said first and second transistors having a base which is connected to a terminal between said first and second elements, wherein said first and second transistors generate a difference current at said node equal to the difference between the collector currents of said first and second transistors;

resistor means, operatively connected to said second element, for determining the value of a constant current for generating bias voltages;

a third transistor arranged between the bias output terminal and the d.c. supply terminal;



a negative feedback circuit arranged between the base of said third transistor and said node, said difference current being introduced as an input thereto;

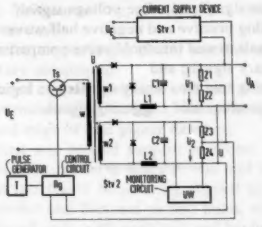
a starting element, connected to the d.c. supply terminal, for supplying currents to said first and second elements and to said first and second transistors in an initial state when the power is turned on, whereby said negative feedback circuit operates to generate said constant current.

4,230,981

CURRENT SUPPLY INSTALLATION WITH VOLTAGE-CONTROLLED CURRENT SUPPLY DEVICES CONNECTED IN PARALLEL ON THE OUTPUT SIDE

Klaus Rambold, Krailling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 967,109
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755510
Int. Cl.[3] G05F 1/64; H02J 1/12
U.S. Cl. 323—25 8 Claims

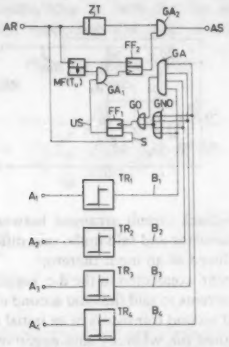


1. A current supply installation comprising: at least two voltage-controlled current supply devices connected in parallel at an output side without decoupling means; each current supply device having voltage control means controlled by an actual voltage value; each current supply device having means for forming a compound voltage value from a first voltage proportional to its no-load voltage and a second voltage proportional to its output voltage; said compound voltage value forming a basis for the actual voltage value for the voltage control means; and means for evaluating the no-load voltage for monitoring purposes.

4,230,982
PROCESS AND DEVICE FOR SHORT-CIRCUIT MONITORING OF ELECTRICAL LINES

Ivan De Mesmaeker, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 23, 1978, Ser. No. 953,637
Claims priority, application Switzerland, Oct. 28, 1977, 13123/77
Int. Cl.[3] G01R *31/08*
U.S. Cl. 324—52 3 Claims



1. A method for monitoring an electric line for short-circuits occurring within a predetermined distance from a measuring location at the line, in which line phase detection signals dependent on the distance between the measuring location and the short-circuit location are formed from the line current and the line voltage at the measuring location, and in which timewise immediately successive ones of said detection signals are subjected to a detection and comparison of their relative phase angles with a threshold value of at least approximately 180° to produce a triggering signal in the event of a short-circuit occurring within said predetermined distance, comprising the steps of:

(a) forming at least three reference signals proportional to the voltage drop across a reference impedance each caused by a line current signal applied to the respective reference impedance, said at least three reference signals defining a polygonal trigger region;

(b) forming from each of said reference signals a detection signal by forming the difference between a corresponding reference signal and a line voltage signal;

(c) subjecting positive and negative half-waves of said detection signals to said threshold value comparison to produce two binary signals; and

(d) subjecting said two binary signals to a logical OR-operation to produce said triggering signal.

4,230,983
SEED VIABILITY ANALYZER

William C. Steere, Grass Lake, and Stephen S. Wilson, Ann Arbor, both of Mich., assignors to Agro Sciences, Inc., Ann Arbor, Mich.

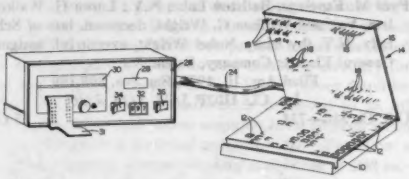
Filed Nov. 24, 1978, Ser. No. 963,378
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—71 R 25 Claims

1. A method of analyzing seed characteristics comprising:

(a) placing a plurality of seeds one each into a plurality of cells in a tray;

(b) filling the cells with a deionized liquid;

(c) allowing the seeds to imbibe the liquid and produce an exudate; and

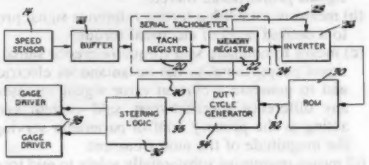


(d) sequentially measuring the conductivity of each of the seed exudates thereby providing an indication of the seed characteristic under analysis.

4,230,984
METHOD AND APPARATUS FOR DRIVING AN AIR CORE GAGE

David W. Taylor, Grand Bland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1979, Ser. No. 22,822
Int. Cl.[2] G01R *15/08*
U.S. Cl. 324—115 4 Claims



4. Apparatus for driving a gage to indicate a value proportional to the magnitude of an input quantity wherein the gage has first and second coils in quadrature to establish a resultant magnetic field and a pointer angularly positioned by the resultant field, comprising

a circuit responsive to the input quantity to generate a binary number proportional to the magnitude of the quantity, the binary number comprising a set of most significant bits changing in value stepwise as the said magnitude increases and a set of least significant bits changing in a repetitive pattern as the said magnitude increases,

a memory addressed by the set of least significant bits for storing a table of numbers representing the tangent of an angle represented by the set of least significant bits to provide a binary output,

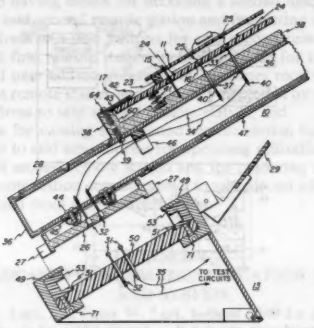
a circuit responsive to the binary output for producing a varying signal proportional to the tangent of the angle represented by the set of least significant bits,

and a steering logic and drive circuit controlled by the varying signal and by the set of most significant bits for producing a variable drive current proportional to the varying signal and a reference drive current equal to the maximum value of the variable drive current, and for selectively applying the two drive currents to the two coils respectively and for controlling the polarity thereof to establish a resultant magnetic field in a direction to position the pointer according to the magnitude of the input quantity.

4,230,985
FIXTURING SYSTEM

John L. Matrone, Guilderland, and Robert D. Roberts, Colonie, both of N.Y., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 12, 1978, Ser. No. 868,822
Int. Cl.[3] G01R 31/02, 15/12
U.S. Cl. 324—158 F 20 Claims



1. A fixturing system for making electrical connections between selected points on a product and an electrical apparatus comprised of:

a product access unit adapted to mate with a receiver and having a field of probes for contacting the selected points, and also having a field of posts electrically connected to the probes, the field of posts being disposed laterally outboard from the field of probes such that all the electrical connections are externally accessible during use and operation of the fixturing system;

a receiver having a field of probes connected to the apparatus and adapted to make electrical contact with the posts when the receiver is mated with the product access unit; and

means for mating the product access unit with the receiver, said mating means including

at least one mating guide connected to the product access unit,

a track slideably mounted on the receiver and having at least one mating slot therein for receiving the guide and a camming surface communicating with each slot for engaging the guide and drawing it into the receiver as the track is slid, and

means for sliding the track on the receiver.

4,230,986
APPARATUS FOR FACILITATING THE SERVICING OF PRINTED CIRCUIT BOARDS

Richard A. Deaver; Ralph C. Eifort, and John A. Nagel, all of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 18, 1978, Ser. No. 970,768
Int. Cl.[3] G01R 31/22
U.S. Cl. 324—158 F 9 Claims

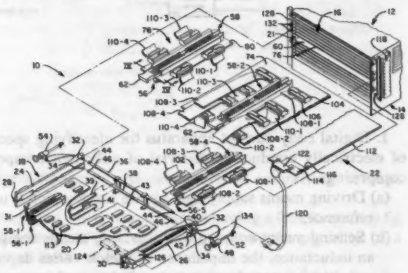
1. In a device having a support structure and a plurality of circuit boards slidably mounted in spaced parallel relationship therein; at least some of said circuit boards forming a group which are electrically intercoupled by means comprising a first member on one side of a said circuit board in said group and a second member located on the opposite side thereof, whereby the first member on said one side of one of said circuit boards is brought into coupling relationship with a said second member of a first adjacent said circuit board in said group and the second member located on said opposite side of said one of said circuit boards is brought into coupling relationship with a said first member on a second adjacent said circuit board in said group as said one of said circuit boards in said group is moved into said support structure; the improvement comprising:

means for supporting one of said circuit boards from said group (hereinafter referred to as the board under test) after it is removed from its space within said support structure;

a coupling means having a said first member on one side thereof and a said second member located on the opposite side thereof whereby the first member of said coupling means is brought into coupling relationship with the second member of said first adjacent circuit board and the second member on said coupling means is brought into coupling relationship with the first member on said second adjacent circuit board as said coupling means is moved into said space from which said board under test is removed;

first means for electrically coupling said first member on said coupling means with said first member on said board under test, and

second means for electrically coupling said second member on said coupling means with said second member on said board under test whereby said board under test is operatively coupled to said first and second adjacent circuit



boards to facilitate testing, servicing and the like on said board under test.

9. A means for supporting a planar member adjacent to a support structure comprising:

first and second support members with said first and second support members each having a recess therein to receive an opposed edge of said planar member;

each said first and second support members having first, second, third and fourth holes in one end thereof, with said third and fourth holes being aligned to at least partially intersect said first and second holes, respectively;

first and second rods, with each said rod having an annular recess formed near each end thereof;

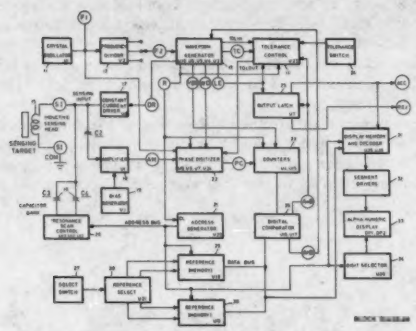
first and second locking pins for each said support member to pass through the associated said third and fourth holes, respectively, to engage the associated said annular recesses of said first and second rods, respectively, when the ends of said first and second rods are inserted in the associated first and second holes, respectively, to thereby maintain said first and second support members in spaced parallel relationship and to also support said opposed edges of said planar member in said recesses; and

means for securing said supporting means to said support structure.

4,230,987
DIGITAL EDDY CURRENT APPARATUS FOR GENERATING METALLURGICAL SIGNATURES AND MONITORING METALLURGICAL CONTENTS OF AN ELECTRICALLY CONDUCTIVE MATERIAL

George Mordwinkin, Scottdale, Pa., assignor to Sensor Corporation, Scottdale, Pa.

Filed Feb. 26, 1979, Ser. No. 15,061
Int. Cl.[3] G01N 27/72; G01R 33/12
U.S. Cl. 324—236 9 Claims



1. Digital eddy current apparatus for identifying specimens of electrically conductive material of unknown composition comprising:

(a) Driving means supplying a square wave which is used as reference;

(b) Sensing means coupled to the driving means comprising an inductance, the impedance of which varies depending on eddy current characteristics of the specimen magnetically coupled thereto, and a capacitance connected with the inductance;

(c) Scanning means for varying the value of said capacitance in steps over a range including the value which resonates with said inductance magnetically coupled to a specimen at the frequency of the driving means square wave and produces a voltage waveform thereacross which is in phase with the square wave, said range also including values of capacitance larger and smaller than the resonating value which produce voltage waveforms out of phase with the square wave;

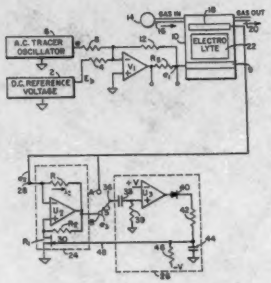
(d) Converting means coupled to the sensing means converting the voltage waveforms across the inductance corresponding to said values of capacitance connected therewith into rectangular pulse outputs, the rectangular pulse output corresponding to the resonating capacitance being positioned in the center of one-half the square wave, the rectangular pulses corresponding to other values of capacitance being offset from the center of one-half the square wave, said offsets being a function of the phase shift of the voltage waveforms; and

(e) Means coupled with the converting means for monitoring the successive values of capacitance and the offsets of the waveforms corresponding to the respective capacitance values so as to provide a capacitance-offset relation which is a function of the metallurgical characteristics of the specimen.

4,230,988
RESISTANCE NEUTRALIZING SYSTEM FOR ELECTROCHEMICAL DEVICES

Raymond B. Stelting, Needham, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 7, 1978, Ser. No. 940,427
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—439 14 Claims



1. Apparatus for measuring the concentration of a gas, comprising

an electrochemical cell having first and second electrodes and arranged to contain an electrolyte between said electrodes, said cell having resistance associated with each of its electrodes and its electrolyte when the electrolyte is present in the cell and capacitance between each electrode and the electrolyte when the electrolyte is present in the cell,

a source of direct current potential,

means providing negative resistance,

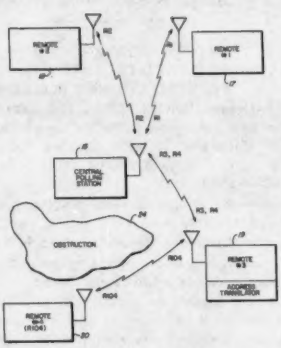
means connecting said cell, said source of direct current potential and said means for producing negative resistance in a circuit, and

means for measuring direct current flowing in said circuit.

4,230,989
COMMUNICATIONS SYSTEM WITH REPEATER STATIONS

William B. Buehrle, Phoenix, Ariz., assignor to Engineered Systems, Inc., Tempe, Ariz.

Filed May 11, 1979, Ser. No. 37,657
Int. Cl.[2] H04B 7/14
U.S. Cl. 375—4 8 Claims



1. A radio communications system including a central station and at least first and second remote stations, said central

station transmitting messages each preceded by a unique address to said first and second remote stations, said system including in combination:

first and second remote stations;

said first remote station having receiving means for receiving messages from said central station and including means for decoding a first unique address for operating utilization means at said first remote station in response to receipt and decoding of such first address, said first station also having means for decoding a second unique address for said second remote station and translating said second address to a new address for said second remote station, said first remote station including means for transmitting said new address followed by messages received by said first remote station and originally preceded by said second address to said second remote station; and

means for causing said second remote station to be responsive to said new address for operating utilization means to said second remote station and for rendering said second remote station nonresponsive to said second address transmitted from said central station.

4,230,990

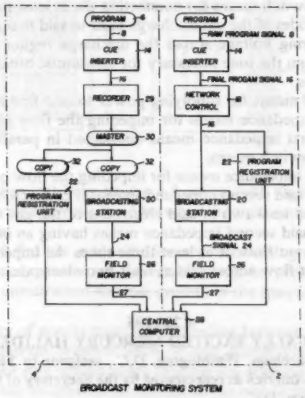
BROADCAST PROGRAM IDENTIFICATION METHOD AND SYSTEM

John G. Lert, Jr.; Peter W. Lert, both of 9549 La Jolla Shores Dr., La Jolla, Calif. 92037, and John F. Cornelius, 1828 Dora Dr., Cardiff by the Sea, Calif. 92007

Filed Mar. 16, 1979, Ser. No. 21,567

Int. Cl.[2] H04B *1/00, 1/06;* **H04N** *7/00;* **G06K** *9/00*

U.S. Cl. 455—67 **67 Claims**



1. The method of identifying certain programs transmitted by a broadcasting station, wherein at least one predetermined and readily identifiable signalling event occurs in conjunction with the broadcast of ones of said programs, said method comprising the steps of:

generating a digital reference feature set from ones of said programs by a transformation of at least one segment of a said program's analog signal content, said segment beginning at a predetermined time with reference to one of said signalling events and being of a predetermined duration;

identifying by a label code the program from which each said reference feature set was derived;

storing a set of said reference feature sets and said associated program label codes in a memory;

detecting said signalling events within the broadcast signal of said broadcasting station;

generating a digital broadcast feature set from ones of said programs broadcast by said broadcasting station, said broadcast feature set being generated by said transformation of at least one segment of the analog broadcast signal content, said segment beginning at a predetermined time with reference to one of said signalling events and being of a predetermined duration;

comparing at least one said broadcast feature set to at least one said reference feature set to produce a recognition output when the degree of similarity between a broadcast feature set and a reference feature set meets a predetermined standard, the broadcast program from which said broadcast feature set was derived being identified by the program label code associated with said reference feature set.

4,230,991

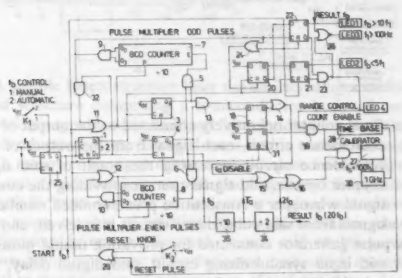
DIGITAL FREQUENCY PROCESS AND METHOD USING FREQUENCY SHIFTING TECHNIQUES, ESPECIALLY FOR LOW FREQUENCY MEASUREMENTS

Alexandre Paphitis, Rua Djalma Ulrich 57, Apt. 1006, Copacabana, 20,000 Rio de Janeiro ZC-37, Brazil

Filed Sep. 11, 1978, Ser. No. 941,495

Int. Cl.[3] H04B *1/02*

U.S. Cl. 328—140 **22 Claims**



1. Digital frequency processing method comprising the steps of:

(a) providing a first train of pulses having a first frequency f_1;

(b) dividing said first train of pulses into a plurality of x second trains of pulses;

(c) counting n pulses of a second frequency f_b for each pulse of each second train of pulses; and

(d) providing an output related to the total number of pulses of said second frequency which have been counted during a time base, said first and second frequencies obeying the following condition:

$$nf_1 \cong f_b \cong (n/x)f_1.$$

4,230,992

REMOTE CONTROL SYSTEM FOR TRAFFIC SIGNAL CONTROL SYSTEM

John A. Munkberg, Forest Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 803,037, Jun. 3, 1977, Pat. No. 4,162,477. This application May 4, 1979, Ser. No. 36,067

Int. Cl.[3] H03K *5/153*

U.S. Cl. 328—140 **3 Claims**

1. A signal discriminating circuit for providing a control signal only in response to a consecutive predetermined number of input signals presented at a predetermined frequency, the circuit including

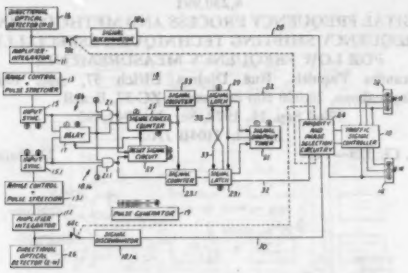
a digital delay circuit;

a coincidence circuit;

an input synchronizing circuit portion for receiving the input signals and having its output operatively connected to the input of said delay circuit and to an input of said coincidence circuit, said delay circuit having its output

operatively connected for providing an input signal to said coincidence circuit, said coincidence circuit portion providing a coincidence indicating signal each time coincidence occurs between a signal from the output of said synchronizing circuit portion and a signal from the output of said delay circuit portion.

means operatively connected to said coincidence circuit and said delay circuit and responsive to one of said signals from the output of said coincidence circuit for preventing said coincidence circuit from providing another one of said signals at its output for a time period equal to the delay time of said delay circuit;



a signal counter operatively connected to the output of said coincidence circuit, each signal from the output of said coincidence circuit increasing the count of said signal counter by one, said signal counter providing the control signal whenever a consecutive predetermined number of signals from said coincidence circuit is received; and

a pulse generator connected for providing timing pulses to said input synchronizing circuit, said digital delay, said coincidence circuit, and said means operatively connected to said coincidence circuit and said delay circuit.

4,230,993

PROCESS FOR INCREASING THE PULSE REPETITION FREQUENCY IN A LASER

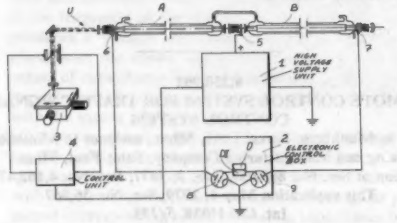
Gianfranco Cirri, Florence, Italy, assignor to Valfivre S.p.A., Florence, Italy

Filed Apr. 20, 1978, Ser. No. 898,335

Claims priority, application Italy, Apr. 19, 1977, 22604 A/77

Int. Cl.[2] H01S *3/10*

U.S. Cl. 331—94.5 M **6 Claims**



1. A process for increasing the pulse repetition frequency of a laser of the type including first and second series connected discharge tubes, a supply unit for supplying energy to said discharge tubes and a pulse generator for controlling the discharge of said discharge tubes, said process comprising the steps of:

alternately discharging each of said discharge tubes;

charging one of said first and second discharge tubes while the remaining said discharge tube is discharging.

4,230,994

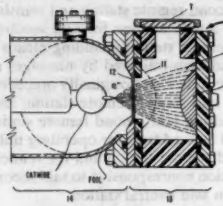
PULSE CIRCUIT APPARATUS FOR GAS DISCHARGE LASER

Laird P. Bradley, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 31, 1978, Ser. No. 911,248

Int. Cl.[3] H01S *3/097*; H05B *41/14*

U.S. Cl. 331—94.5 PE **15 Claims**



1. A pulse circuit apparatus for supplying voltage and power at two voltage levels to a gas discharge laser the apparatus comprising:

a gas discharge laser for using a gas as a laser medium;

said gas discharge laser having at least two electrodes substantially defining a discharge region;

a first means for supplying power to said electrodes at a voltage higher than the breakdown voltage of the gas and in a time before the gas can substantially breakdown;

a rapid switch means for connecting the at least two of said electrodes of the gas discharge laser to said first means for supplying voltage across the discharge region in a time less than the time necessary for substantial breakdown of the gas;

a second means for supplying power to said first means;

a first impedance means for impeding the flow of current, said first impedance means connected in parallel to the rapid switch means;

a second impedance means for impeding the flow of current, where said second impedance means is connected in parallel to at least two of said electrodes of the gas discharge laser, said second impedance means having an impedance to current flow of at least three times the impedance for current flow across said at least two electrodes.

4,230,995

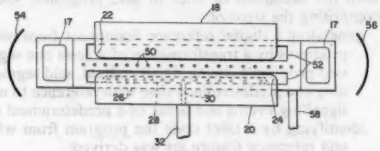
ELECTRICALLY EXCITED MERCURY HALIDE LASER

Ralph L. Burnham, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,377

Int. Cl.[3] H01S *3/223*

U.S. Cl. 331—94.5 G **7 Claims**



1. In an improved, pulsed, wavelength-tunable laser producing emitted laser energy by electron-impact dissociation of metal dihalides and their cyclic recombination comprising a sealed enclosure including end windows at Brewster's angle, first and second elongated electrodes supported in parallel-spaced relationship within said enclosure along the principle

axis of said enclosure with external electrical terminals connected with said electrodes, means within said enclosure extending along the length of said electrodes for supporting a metal dihalide therein, means for adding a buffer gas of helium into said sealed enclosure, electrode means within said sealed enclosure for preionizing the gases within said sealed enclosure, a fully and partially reflective surface in alignment with the principle axis of said sealed enclosure for producing optical resonance of the emitted laser energy, and a heat source for vaporizing and maintaining said metal dihalide in a vaporized state, the improvement comprising:

a buffer gas of from 5 to 15% nitrogen within said sealed enclosure; and

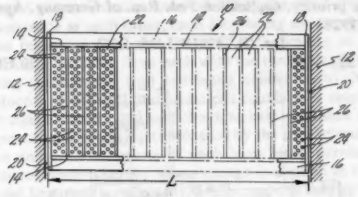
means for adding said buffer gas of nitrogen into said sealed enclosure which is mixed with said helium buffer gas and added to said sealed enclosure prior to preionizing of said gases.

4,230,996

NOZZLE ARRAY FOR CHEMICAL LASERS

Curtis H. Cook, Jr., Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1978, Ser. No. 970,949
Int. Cl.³ H01S 3/02
U.S. Cl. 331—94.5 D **6 Claims**



1. In a chemical laser having a housing with rigid support walls, a nozzle array disposed between the rigid support walls comprising:

a pair of flexible sidewalls for accommodating spanwise thermal expansion of the nozzle array to provide relatively unrestrained thermal growth in the spanwise direction;

a plurality of nozzle manifolds extending between the flexible sidewalls wherein each of said nozzle manifolds is disposed in a spaced apart relationship with one another along the lengthwise dimension of the nozzle array;

a plurality of support beams extending between the flexible sidewalls and fixedly attached at each end thereto, wherein each of said support beams is sequentially positioned between the nozzle manifolds;

a relief slot disposed lengthwise between the flexible sidewalls within each of said support beams for absorbing lengthwise thermal expansion of the nozzle array;

a pair of end walls each disposed between the pair of flexible sidewalls wherein the end walls and the sidewalls enclose the nozzle manifolds therebetween and said end walls are disposed proximate the support walls of the housing in a spaced apart relationship thereto at ambient temperature; and

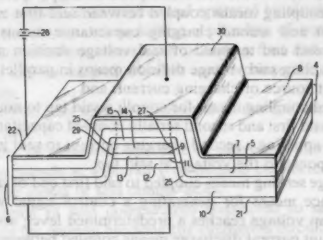
a restoring bar fixedly attached to a top portion of each of the flexible sidewalls for providing lengthwise elastic restoration of plastic thermal compression of the nozzle array during the operation of the laser and for accumulating, transferring and delivering a load required to stretch the end wall for spanwise thermal expansion compatibility.

4,230,997

BURIED DOUBLE HETEROSTRUCTURE LASER DEVICE

Robert L. Hartman, Warren Township, Somerset County, N.J.; Marc Ilegems, Renens, Switzerland; Louis A. Koszi, Scotch Plains, and Wilfried R. Wagner, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1979, Ser. No. 7,429
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 H **10 Claims**



1. A double heterostructure laser device including a multilayered structure comprising a semiconductor body of one conductivity type, a wide bandgap first cladding layer of the same conductivity type disposed on a major surface of said body, a narrower bandgap active region disposed on said first layer, and a wide bandgap second cladding layer of opposite conductivity type disposed on said active region, said active region being capable of emitting stimulated radiation when said cladding layers are forward biased, said multilayered structure having the shape of an elongated mesa which extends parallel to the direction of propagation of said radiation, electrode means for applying said forward bias and means for forming an optical resonator for said radiation CHARACTERIZED IN THAT

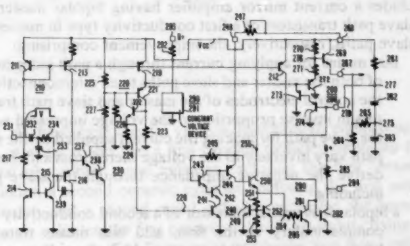
a native oxide coating is disposed on the side walls of said mesa and an overgrowth layer is disposed on said mesa, said overgrowth layer comprising polycrystalline material contiguous with said oxide and monocrystalline material contiguous with the top of said mesa.

4,230,998

TELEVISION VERTICAL RAMP GENERATOR

Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 829,534, Aug. 31, 1977. This application Mar. 7, 1979, Ser. No. 18,363
Int. Cl.³ H03K 3/282
U.S. Cl. 331—111 **11 Claims**



1. A ramp generator comprising:

first and second serially coupled charging capacitance means including a juncture therebetween;

a source of potential defined between a point of supply potential and a point of reference potential;

means, including a first source of charging current coupled between a first end of said first and second charging capacitance means and said point of supply potential and a connection between a second end of said charging capacitance means and said point of reference potential, for forming a ramp voltage across said first and second capacitance means;

voltage division means comprising first and second end terminals and having a tap therebetween, said first end terminal connected to said point of supply potential;

first coupling means coupled between said first end of said first and second charging capacitance means and said second end terminal of said voltage division means, for coupling said voltage division means in parallel with said first source of charging current; and

second coupling means for coupling said tap to said juncture of said first and second serially coupled capacitance means for applying a second charging current to said juncture in response to the voltage at said tap;

voltage sensing means coupled to said first end of said capacitance means for generating a control signal when said ramp voltage reaches a predetermined level; and

constant current discharge means coupled between said first end of said capacitance means and said point of reference potential and responsive to said control signal for providing a constant current discharge path for said capacitance means.

4,230,999

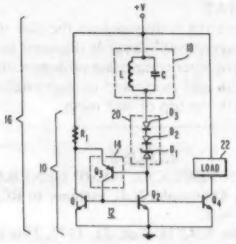
OSCILLATOR INCORPORATING NEGATIVE IMPEDANCE NETWORK HAVING CURRENT MIRROR AMPLIFIER

Adel A. A. Ahmed, Clinton Twp., Hunturdon, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1979, Ser. No. 24,601

Int. Cl.³ H03B *7/06*

U.S. Cl. 331—115 **8 Claims**



1. In a negative impedance network of the type which includes a current mirror amplifier having bipolar master and slave path transistors of a first conductivity type in master and slave paths, respectively, the improvement comprising:

bias means for applying current through a path independent of both the master and slave paths to an interconnection of the control electrodes of the master and slave path transistors in inverse proportion to the voltage impressed across the slave path for making the current supplied by the slave path vary inversely to the voltage thereacross and thereby derive the negative impedance through the slave path, including

a bipolar bias means transistor of a second conductivity type complementary to the first, said bias means transistor having an emitter electrode to which the collector electrode of said master path transistor is direct coupled, a collector electrode connected to the interconnection of the control electrodes of the master and slave path transistors to apply the bias current thereto, and having a bias electrode to which the voltage applied across the slave path is impressed;

the master and slave path transistors having their emitter electrodes commonly connected to a reference voltage level,

a supply voltage level being applied through a resistance to the collector electrode of the master path transistor;

an intermediate voltage level between said supply voltage level and said reference voltage level being applied to both the base electrode of said bias means transistor and the collector electrode of the slave path transistor; and

said intermediate voltage level being applied through a tuned inductance-capacitance circuit having an equivalent dynamic resistance, the negative impedance of the network being derived as the change in said intermediate voltage level divided by the change resulting therefrom in the level of current flow through the slave path and having a magnitude of at least the magnitude of said equivalent dynamic resistance to thereby result in oscillatory current flow through the slave path at the resonant frequency of said tuned circuit.

4,231,000

ANTENNA FEED SYSTEM FOR DOUBLE POLARIZATION

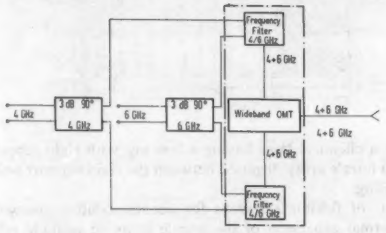
Eberhard Schuegraf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,122

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719283

Int. Cl.² H01P *5/18, 5/12*

U.S. Cl. 333—109 **20 Claims**



1. Antenna feed system for double polarization in two high-frequency bands of different frequency position, consisting of a polarization shunt with a connecting flange in common on the antenna side for both frequency bands and two directional connections respectively allocated to one polarization direction for a respective frequency shunt whose connection in common for said two frequency bands is respectively connected to one of said directional connections of said polarization shunt, consisting of a first three decibel directional coupler for the lower frequency band whose double axis is respectively connected to one further connection of both frequency shunts allocated to the lower frequency band, and consisting of a three decibel directional coupler for said upper frequency band which is respectively connected to one further connection of the frequency shunts allocated to said upper frequency band, characterized in that the polarization shunt is constructed phase-symmetrical with respect to its pass-through paths, in that the directional connections of said polarization shunt are connected directly to the frequency shunts or respectively are connected via two 45° twisted pieces of different twisting direction which are precisely constructionally symmetrical, and in that the connecting lines between said frequency shunts and said three decibel directional couplers for respectively two frequency bands of the same frequency ranges, said frequency bands existing in dual polarization directions, are constructed

at the respectively same line location as phase-symmetrical line pairs with connection elements which coincide by pairs.

4,231,001

CONSTANT RESISTANCE COUPLING NETWORK

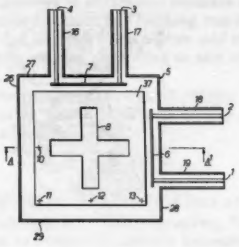
Ronald Hutchinson, Galleywood, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Mar. 12, 1979, Ser. No. 19,924

Claims priority, application United Kingdom, Apr. 11, 1978, 14088/78

Int. Cl.³ H01P *5/18, 1/213*

U.S. Cl. 333—110 **12 Claims**



1. A constant resistance electrical network including a resonator plate mounted within a cavity and two coupling loops arranged as transmission lines exhibiting the same characteristic resistance as each other, each loop being mounted adjacent to the resonator plate and the wall of the cavity so as to be electrically insulated from each with the two ends of each loop passing through the wall and being connected to the centre conductor of an input and an output coaxial line respectively, each coaxial line having said characteristic resistance and each output coaxial line being terminated by the characteristic resistance and with the plane of each loop being parallel to the resonator plate whereby when energy is applied to one input coaxial line none is reflected thereby, and the energy is shared between the two output coaxial lines in dependence on the frequency of the energy in relation to the resonant frequency of the plate.

4,231,002

TRANSVERSAL FILTER HAVING PARALLEL INPUTS

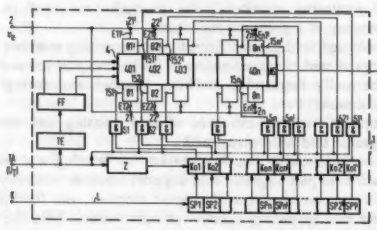
Karl Knauer, Kirchseeon, and Hans-Joerg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,242

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2814053

Int. Cl.² H03H *7/28, 7/10;* **H03K** *5/156;* **G11C** *19/28*

U.S. Cl. 333—165 **12 Claims**



1. In a transversal filter of the type in which an analog charge transfer device shift register is integrated on a doped semiconductor substrate and includes a plurality of stages which have parallel inputs for receiving an input signal and a plurality of evaulation circuits connected thereto, each evaluation circuit including an area doped opposite to the substrate, first and second input gates and a transfer gate immediately adjacent the transfer channel of the charge transfer device shift register, one of the input gates connected to an input signal, the other input gate connected to a constant voltage and the oppositely doped area and the transfer gate respectively connected to receive first and second clock pulses from a clock, and in which the charge transfer device shift register includes an output, in combination therewith, the improvement comprising:

a counter connected to receive and operated by clock pulses from the clock, and including a plurality of outputs; a plurality of comparators each including first and second inputs and an output, the first inputs connected to said counter;

a plurality of gate circuits connected to the evaluation circuits; and

a plurality of memories operable to provide a plurality of output signals at a plurality of outputs connected to respective inputs of said comparators,

said outputs of said comparators connected to said gate circuits for causing blocking the evaluation circuits to one of the clock pulses as a function of the respective comparison results between said counter output signals and said memory output signals.

4,231,003

SHIELD-TYPE COAXIAL VACUUM FEEDTHROUGH

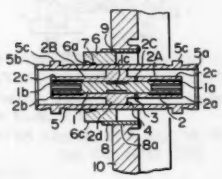
Hajime Ishimaru, Ibaraki, Japan, assignor to The Director-General of National Laboratory for High Energy Physics, Ibaraki, Japan

Filed Dec. 20, 1978, Ser. No. 971,540

Claims priority, application Japan, Dec. 21, 1977, 52-153866

Int. Cl.³ H01P *1/04, 5/00*

U.S. Cl. 333—33 **4 Claims**



1. A shield-type coaxial vacuum feedthrough comprising a pin of metal round bar, a first ceramic cylinder enclosing the metal pin, a first metal cylinder enclosing the first ceramic cylinder, a second ceramic cylinder enclosing the first metal cylinder, and a second metal cylinder enclosing the second ceramic cylinder, the first ceramic cylinder air-tightly fixing to the metal pin at a first fixing point and to the first metal cylinder at a second fixing point axially departing from the first fixing point, the second ceramic cylinder airtightly fixing to the first metal cylinder at a third fixing point axially departing

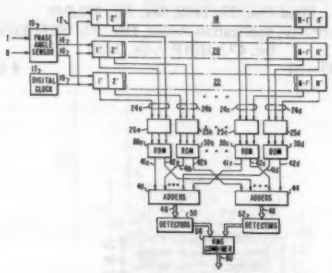
from the first and second fixing points and to the second metal cylinder at a fourth fixing point axially departing from the first, second and third fixing points, wherein the first ceramic cylinder has a larger-diameter part fixing to the first metal cylinder and the metal pin has a smaller-diameter part in a position corresponding thereto so that the characteristic impedance of the area corresponding to the larger-diameter part is matched with the characteristic impedance of the adjacent area.

4,231,005

CONSTANT FALSE ALARM RATE RADAR SYSTEM AND METHOD OF OPERATING THE SAME

John W. Taylor, Jr., Baltimore City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 9, 1979, Ser. No. 55,889
Int. Cl.[3] G01S *13/02*
U.S. Cl. 343—5 NQ **32 Claims**



13. A phase angle sensor for use in a constant false alarm rate (CFAR) type radar receiver which derives the in-phase (I) and quadrature (Q) components of received radar echo signals with respect to a local reference oscillator, said sensor comprising:

means for measuring the phase angle of the vector of the received echo signal as one of four phase angle quadrants, segmented from the phase angle interval of 0° to 360° with respect to the local reference oscillator, based on the relative polarity of the I and Q components; and

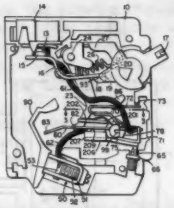
means for further measuring the phase angle of the vector of the echo signal as one of the two octants of the phase angle quadrant into which the vector of the echo signal is resolved in accordance with a function based on the relationships of the I and Q echo vector components.

4,231,006

CIRCUIT BREAKER HAVING A THERMALLY RESPONSIVE LATCHING MEMBER

Harold E. Belttary, Rio Piedras, P.R., assignor to Sylvania Circuit Breaker Corporation, Canovanas, P.R.

Filed Mar. 26, 1979, Ser. No. 23,800
Int. Cl.[3] H01H *73/48*
U.S. Cl. 335—36 **4 Claims**



1. A circuit breaker including in combination a housing of insulating material;

a fixed contact mounted in said housing;

a movable handle mounted in said housing;

a contact carrier with a movable contact thereon and pivotally engaging said handle at a pivot point;

a trip arm pivotally mounted in said housing;

an overcenter spring connected between said contact carrier and said trip arm urging said contact carrier against said handle;

said handle, contact carrier, and overcenter spring forming an overcenter arrangement for closing said contacts when the spring is on one side of said pivot point and for opening said contacts when the spring is on the other side of said pivot point;

a load terminal mounted in said housing;

a thermally responsive latching member connected in circuit between said load terminal and said movable contact, said latching member having a locating hole therewithin;

an armature;

an armature spring affixed to said armature and having a free end provided with an annular boss adapted to fit within said locating hole;

a mounting member holding the thermally responsive latching member at a portion thereof adjacent to one end;

said mounting member being pivotally mounted in said housing at a pivotal connection;

a U-shaped field piece affixed to said mounting member with legs of said piece extending at both sides and toward said thermally responsive latching member and facing said armature;

a support member mounted in said housing and bearing against said field piece; and

a mounting spring bearing against the housing and urging said field piece against said support member whereby said pivotal connection, said support member, said field piece, and said mounting member in combination hold the portion of the thermally responsive latching member adjacent said one end fixed with respect to the housing, said thermally responsive latching mechanism being rotatable about the pivotal connection against the urging of said mounting spring;

said thermally responsive latching member having a latching surface adjacent the opposite end thereof engaging said trip arm and maintaining said trip arm in a set position when said contacts are closed, with said overcenter spring urging said trip arm toward a tripped position;

said thermally responsive latching member bending in response to a predetermined current condition to move said opposite end of the thermally responsive latching member and disengage said latching surface from said trip arm releasing said trip arm for movement to the tripped position;

said U-shaped field piece being adapted to intercept lines of flux of a magnetic field created by a predetermined amount of current flowing through said thermally responsive latching member to attract said armature against said latching member to rotate said latching member thereby disengaging said latching surface from said trip arm, releasing said trip arm for movement to said tripped position; and

movement of the trip arm to the tripped position moving the overcenter spring to the other side of said pivot point causing said contacts to open.

4,231,007

HIGH VOLTAGE SWITCH FOR COOKING APPARATUS

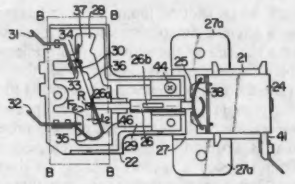
Junzo Tanaka, Fujiidera, and Chikao Urashima, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 782,166, Mar. 28, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,498

Claims priority, application Japan, Mar. 31, 1976, 51-36428; Sep. 25, 1976, 51-115303

Int. Cl.³ H01H *51/08*

U.S. Cl. 335—131 **12 Claims**



1. A high voltage switch comprising:

a contact making and breaking chamber made of insulative material for accommodating a conducting movable member carrying a movable contact for switching a high voltage and a stationary contact member carrying a stationary contact, said conducting movable member being made of a resilient material having at one end a U-shaped hinge portion and having at the other end said movable contact, said one end of said conducting movable member having the U-shaped portion being fixed to a wall of said contact making and breaking chamber thereby to maintain normally closed said movable and said stationary contacts by a resilient force exerted by the U-shaped hinge portion;

an electromagnet device having a movable aramture pivotably supported at one end thereof by a yoke;

an elongated slider made of insulative material and having one end coupled to a free end of said movable armature and having the other end coupled to said conducting movable member for transmitting a driving force of said electromagnetic device to said conducting movable member;

a slider guide chamber made of insulative material for guiding said elongated insulative slider and for insulatively isolating said contact making and breaking chamber from said electromagnetic device, said slider guide chamber having apertures formed in opposite walls for slidably guiding therethrough said elongated insulative slider and for enclosing substantially the entire length of said elongated insulative slider in a dust-proof manner.

4,231,008

COIL FOR THE PRODUCTION OF HOMOGENEOUS MAGNETIC FIELDS

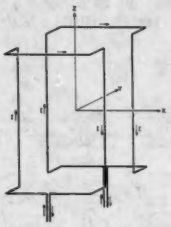
Gottfried J. Krueger, Reno di Leggiuno, Italy, assignor to European Atomic Energy Community, Luxembourg

Filed Nov. 29, 1978, Ser. No. 964,640

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2755357

Int. Cl.³ H01F *7/06, 7/22*

U.S. Cl. 335—209 **6 Claims**



1. A coil for the production of a magnetic field, the coil comprising 2 n turns, n being a positive integer greater than unity, said coil having n sets of coil sides, each set being disposed parallel to a common axis and the coils in each set being disposed symmetrically with respect to two orthogonal axes at right angles to said common axis, and wherein the distance R_μ of the coil sides to said common axis and the angle ϕ_μ between an axis (x) of the two axes and a notional line joining the common axis to the coil side in the first quadrant of the coordinate system defined by said two axes are such that n equations are satisfied for equal currents through every coil side, each of said equations being of the form

$$\sum_{\mu=1}^{n} \cos(2r+1)\phi_\mu / R_\mu(2r+1) = 0$$

where r is a positive integer, which for the respective n equations, has the values 1, 2, 3 . . . n.

4,231,009

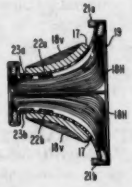
DEFLECTION YOKE WITH A MAGNET FOR REDUCING SENSITIVITY OF CONVERGENCE TO YOKE POSITION

William H. Barkow, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,243

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—212 **11 Claims**



1. A self-converging deflection yoke assembly for use with a wide-angle in-line color television kinescope, comprising:

means for producing deflection fields having a nonzero average nonuniformity for substantially converging the

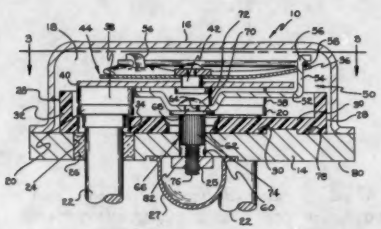
electron beams at all points on the raster, and also having a region about the entrance end of said yoke in which the average field nonuniformity is substantially zero for reducing the effect of yoke positioning relative to said electron beams.

4,231,010

THERMOSTATIC SWITCH EMPLOYING A STUD MEMBER FOR CALIBRATION OF THE SWITCH

Wilfred W. Cardin, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1978, Ser. No. 965,447
Int. Cl.[3] H01H *61/01*
U.S. Cl. 337—94 **6 Claims**



1. A thermostatic electrical switch comprising fixed contact means; means including a member having a through bore therein supporting the fixed contact means; movable contact means; thermostatic means carrying the movable contact means for moving the movable contact means in response to selected temperature changes; and means mounting the thermostatic means on said member, said mounting means comprising stud means having a portion secured to said thermostatic means, having a portion of selected diameter extending into a selected part of said bore from one side of the member with an interference fit in said part of bore to prevent rotation of the stud means in the bore and to prevent axial movement of the stud means further into the bore from said one side of the member, and having a threaded portion passing through the remainder of said bore to extend from the opposite side of the member, and nut means threadedly engaging said threaded portion of the stud means and bearing against said opposite side of the member to prevent axial movement of the stud means in an opposite direction within said bore, thereby to locate the thermostatic means in a selected position spaced from said one side of the member so that the thermostatic means is adapted to move the movable contact means between an open circuit position spaced from the fixed contact means and a closed circuit position engaged with the fixed contact means in response to said selected temperature changes.

4,231,011

DISCONTINUOUS METAL FILM RESISTOR AND STRAIN GAUGES

Robert M. DelVecchio, Vandergrift, and Zvi H. Meiksin, Pittsburgh, both of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

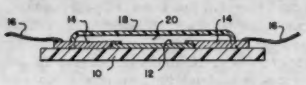
Filed Sep. 24, 1979, Ser. No. 78,486
Int. Cl.[3] G01L *1/22*
U.S. Cl. 338—2 **6 Claims**

1. A strain gauge comprising:

a. a substrate composed of nonconductive material,

b. a discontinuous metal film on the substrate,

c. a plurality of electrodes attached to the metal film, and



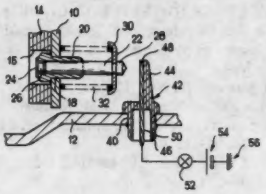
d. means for maintaining an environment having a constant humidity in the range of 15% to 45% about the discontinuous metal film.

4,231,012

DRUM BRAKE WEAR INDICATOR

Gerard Volan, Velizy, and Jean-Jacques Carre, Montreuil, both of France, assignors to Societe Anonyme DBA, Paris, France

Filed May 31, 1979, Ser. No. 43,986
Claims priority, application France, Jun. 15, 1978, 78 17938
Int. Cl.[3] B60T *17/22*
U.S. Cl. 340—52 A **12 Claims**



1. A drum brake friction lining wear indicator of the kind comprising a plunger slidably mounted in a conductive sleeve inserted into the rim of the segment and comprising a flared head adapted to be worn by contact with the drum surface after a certain amount of wear on the segment lining, a spring pressing the plunger towards means forming an electric contact, against which the free end of the plunger presses when the plunger head is worn and the spring is released and slides the plunger along the sleeve, a plate holding the drum brake and bearing the electric contact means substantially in line with the sleeve at a distance from the end of the sleeve which is less than the length of the sleeve, said electric contact means being formed on a connecting block extending through the plate holding the brake and having a surface comprising at least one electric contact opposite the free end of the plunger inside the brake, electric means being provided in that part of the block which projects from the outer surface of the plate.

4,231,013

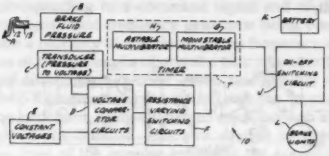
VEHICLE BRAKE LIGHT ILLUMINATION SYSTEM

William H. Freeman, 765 W. Oak Dr., Glendale, Mo. 63122, and David C. Golden, St. Peters, Mo., assignors to William H. Freeman, Glendale, Mo.

Continuation of Ser. No. 700,015, Jun. 25, 1976, abandoned. This application Aug. 17, 1978, Ser. No. 934,607
Int. Cl.[2] B60Q *1/26, 1/44*
U.S. Cl. 340—72 **11 Claims**

1. An improved brake light illumination system for a vehicle having a force actuated brake control and at least one brake light, the improvement comprising transducer means engaged to said brake control for generating an electrical signal proportionate to the magnitude of force applied to said brake control, and circuit means connecting said transducer means and said at least one light for intermittently energizing said light at a duty cycle providing an intermittent rate dependent upon the magnitude of said electrical signal, said rate being sufficiently great that the human eye cannot detect any pulsation of the light

being emitted from said brake light, thereby steadily illuminating said light at intensity levels which are directly related to the magnitude of force applied to said brake control, said circuit means including a signal modifying circuit responsive to said electrical signal for converting said electrical signal to a



control signal having a multiplicity of discrete steps, and a control circuit responsive to said multiplicity of steps of said control signal for causing said duty cycle of energizing said light to provide a corresponding multiplicity of discrete intensity levels.

4,231,014

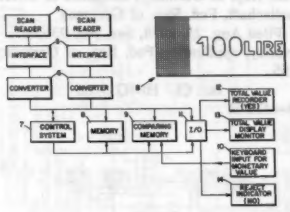
PROCESS AND APPARATUS FOR AUTOMATICALLY IDENTIFYING DISCOUNT COUPONS AND THE LIKE BY MEANS OF ELECTRONIC COMPARISON

Vittorio Ponzio, Via Tortora 74, Milan, Italy

Continuation-in-part of Ser. No. 780,162, Mar. 22, 1977, abandoned. This application Apr. 17, 1979, Ser. No. 30,910

Int. Cl.[2] **G06K** *9/00*

U.S. Cl. 340—146.3 Y **11 Claims**



1. A process for automatically identifying coupons having zones of different color tones comprising the steps of:

(a) introducing a sample word into a comparing memory;

(b) scan reading all zones of both surfaces of said coupons;

(c) converting and adding signals relating to said zones of different color tones to form a word identifying each of said coupons;

(d) comparing said word with said sample word; and

(e) obtaining and separating acceptance signals and rejection signals relating to respective accepted and rejected coupons.

4,231,015

MULTIPLE-PROCESSOR DIGITAL COMMUNICATION SYSTEM

Donald C. Union, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Sep. 28, 1978, Ser. No. 946,566

Int. Cl.[3] **H04Q** *9/00*; **G06F** *11/00*

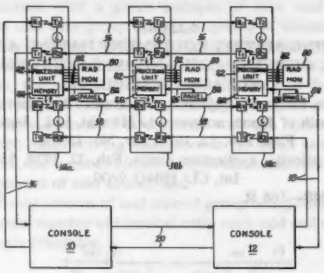
U.S. Cl. 340—147 R **1 Claim**

1. A system for communicating among two central consoles and a plurality of local controllers, comprising:

first and second central consoles for controlling the communication of said system, said consoles selectively issuing command messages to said controllers and for receiving response messages therefrom;

a first two line communication path for selectively transmitting messages in both directions, said first path extending from one central console serially to and being connected to all of said plurality of controllers;

a second two line communication path for selectively transmitting messages in both directions, said second path extending from the other console serially to and being connected to all of said plurality of controllers, the controllers being connected nearer to said first console via said first path also being connected relatively farther from said second console via said second path;



an interconnecting communication path interconnecting said consoles;

said first console being capable of communicating with each of said controllers via said first path an via said interconnecting path, said second console and said second path;

said second console being capable of communicating with each of said controllers via said second path and via said interconnecting path, said first console and said first path.

4,231,016

INPUT SIGNAL RECOGNITION CIRCUIT

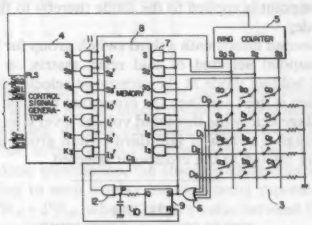
Shigeki Ueda, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 27, 1978, Ser. No. 964,054

Claims priority, application Japan, Dec. 2, 1977, 50/145251

Int. Cl.[3] **H04Q** *9/00*; **G08C** *9/00*

U.S. Cl. 340—166 R **3 Claims**



1. An input signal recognition circuit comprising:

an input section having a plurality of switching elements arranged in rows and columns forming an electrical matrix for keying in operation commands;

a sense signal generating section for cyclically producing, on a plurality of sense lines respectively connected to the switching elements in a column of said matrix, respective sense signals, the sense signals in each cycle being sequentially produced on said plurality of sense lines to provide a sense signal sequence which successively scans said sense lines;

a control section including a memory section for storing row data indicating the activated switching elements in a column of said matrix, said row data being detected by said

control section during the presence of a sense signal on a sense line associated with a column of said matrix, said control section decoding data stored in said memory section and producing an output representing said row data after all sense lines associated with columns of said matrix have been scanned by respective sensing signals in a sense signal cycle, said control section clearing the contents of said memory section and supplying no output representing row data when, in a sense signal cycle, row data is detected from different columns of said matrix.

4,231,017

SWITCHING MATRIX EQUIPMENT HAVING A SERIES CIRCUIT OF RELAY COIL AND SELF-HOLDING DIODE AT EACH CROSSPOINT

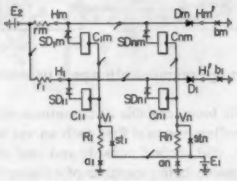
Toshikatsu Kiriyama, Fujisawa, and Yoshiro Hasegawa, Kamakura, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 22, 1979, Ser. No. 13,832

Claims priority, application Japan, Feb. 22, 1978, 53-18456

Int. Cl.³ H04Q *9/00*

U.S. Cl. 340—166 R **6 Claims**



1. A switching matrix equipment comprising:

(a) a relay matrix having series circuits each including at least one relay coil connecting at one end to one end of a self-holding diode with a threshold level and each disposed at each crosspoint;

(b) a first means with first and second switch groups for designating a row and a column of said relay matrix, in which a crosspoint of said relay matrix is selected by closing a single switch of each of said first and second switch groups and a voltage exceeding the threshold voltage level of the self-holding diode at the selected crosspoint is applied to the diode thereby to fire the same diode;

(c) a second means with a third switch group for holding the crosspoint selected of said relay matrix, in which the self-holding diode at the crosspoint selected by said first means is fired and then the crosspoint selected is held at a voltage below the threshold voltage level which is applied through a switch of said third switch group correspondingly related to the crosspoint selected.

4,231,018

TONE SIGNAL DETECTOR

Masayuki Imigawa, and Toshihiro Mori, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1977, Ser. No. 854,868

Claims priority, application Japan, Nov. 26, 1976, 51-141860

Int. Cl.² G01R *23/02*; H04Q *9/00*

U.S. Cl. 340—171 R **3 Claims**

1. A tone signal detector for receiving and detecting tone signals comprising:

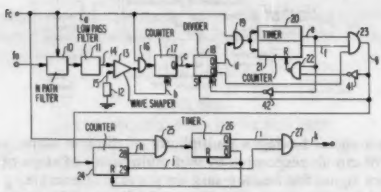
a clock signal generator for generating clock pulses of a frequency equal to N times the frequency of said tone signals, where N is an integer equal to or greater than 2;

an N-path filter for sampling and selecting said tone signals according to the output signals of said clock signal generator;

a low-pass filter connected to said N-path filter for eliminating the component of the frequency of said cook pulses included in the sampled tone signals;

a wave shaping circuit for shaping the signals having passed said low-pass filter to produce pulses;

a gate circuit for controlling the passing of said clock pulses in accordance with the output pulses of said wave shaping circuit;



a counter for counting the number of the output pulses of said gate circuit; and

means responsive to said clock pulses and the output of said counter for detecting whether or not said tone signals are the designated signals by the count of said counter in a prescribed period of time.

4,231,019

REMOTE CONTROL ARRANGEMENT FOR A MEDICAL APPLIANCE

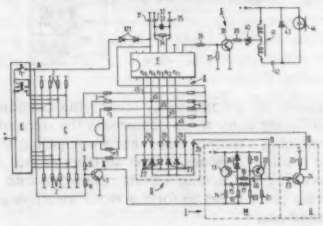
Klaus M. Junginger, Rastatt, and Hermann Kieferle, Karlsruhe, both of Fed. Rep. of Germany, assignors to Stierlen-Maquet Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,065

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738155

Int. Cl.² H04Q *3/00*

U.S. Cl. 340—171 R **11 Claims**



1. A remote control arrangement for a medical appliance comprising a transmitter and a receiver associated with at least one appliance, said transmitter having a number of feed-in keys corresponding to the number of the functions of the appliance to be controlled, said feed-in keys combined physically to form a feed-in keyboard for feeding-in binary command signals in the 1-of-n code associated with the functions, a frequency generator having a plurality of inputs controllable as to its frequency by the feeding-in of a code word corresponding to the relevant command signal, and switchable on as a function of the presence of a command signal, and a transmission converter fed by the frequency generator and transmitting frequency signals corresponding to the command signals, and an amplifier having a reception converter and means for selective amplification of the frequency signal received and of their reconversion into the command signals, and said frequency generator being constructed to generate a group frequency signal in addition to the frequency signals corresponding to the command signals as a function of the feeding-in of an additional group code word, said transmitter having an impulse

generator which can be set in action as a function of the appearance of a command signal, said impulse generator generating output impulses whereby the group code word can be fed into the frequency generator instead of the code word corresponding to the relevant command signal, and said receiver having a circuit which controls the emission of the command signals as a function of the alternate reception of a frequency signal corresponding to a command signal and of the group frequency signal, said frequency generator being constructed to generate a plurality of additional group frequency signals as a function of the feeding-in of one at a time of a corresponding number of different group code words, said impulse generator having two complementary outputs, and the inputs of said frequency generator being connected each through a diode to an output of the impulse generator so that in a prescribed switching state of the impulse generator the potentials corresponding to the binary values appearing at its outputs are connectable through all the diodes poled in the passage direction with reference to the respective potential in accordance with the respective bits of a prescribed group code word to the inputs of said frequency generator.

4,231,020

DIGITAL TO ANALOG CONVERTER HAVING SEPARATE BIT CONVERTERS

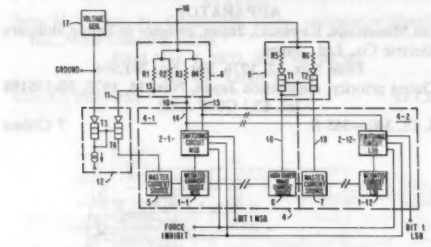
Daniel Azzis, Villeneuve Loubet, and Francois X. Delaporte, Cros de Cagnes, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1978, Ser. No. 938,273

Claims priority, application France, Sep. 30, 1977, 77 30171

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **4 Claims**



1. An improved monolithic D/A converter able to convert N-bit words, of the type including N weighted current sources connected to switching circuits, each switching circuit being controlled by a bit of the word to be converted and steering the current of the associated source either towards an output line or towards a dump line, according to the value of the control bit, wherein the improvement comprises: a first group of weighted current sources of a first type including a high order master current source, n slave current source for generating the high order weighted currents and a slave source which is the image of one of said high order current sources, a second group of weighted current sources of a second type including a low order master current source and m slave sources generating the low order weighted currents, with $N=n+m$, a first group of n switching circuits of a first type connected to said n high order weighted current sources, each switching circuit being provided with an input receiving the current from the source to which it is connected and two outputs, one output being connected to the output line and the second one being connected to the dump line and at least a control input for receiving one bit of the word to be converted, a second group of m switching circuits of a second type connected to the m low order weighted current sources, each switching circuit being provided with an input for receiving the current from the source to which it is connected and two outputs, one output being connected to the output line and the second output being connected to the dump line and at least a control input receiving one bit of the word to be converted, a reference voltage generator being provided with an output delivering a stabilized voltage, first calibrating means connected between the output terminal of said reference voltage generator and said high order master current source, to provide a first calibrating current in accordance with the reference voltage, to said master source, second calibrating means connected to the output terminal of the reference voltage generator and receiving the current from said image source and providing to said low order master source a second calibrating current, the value of which is established relatively to the value of said image source current with a given multiple of two; said current sources of said first group being comprised of identical cells, each cell including a Darlington circuit of switching and driving transistors, the arrangement, comprising at least a pair of transistors, the switching transistor of each pair having an individually biased base and the driving transistor of the pair having a base connected in common with the corresponding bases of the other driving transistors in the other said cells in said source, the number of said cells in each said source defining the current of said source; and

said current sources of said second group being comprised of a certain number of identical cells, each said cell including a single transistor.

4,231,021

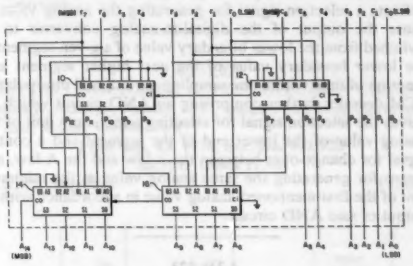
ADDRESS DATA CONVERTER

Donald L. Clark, Holliston, and William P. Graves, Westboro, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,554

Int. Cl.² G06F *3/00*

U.S. Cl. 340—347 DD **6 Claims**



1. An address data converter for converting binary row address information R_A and binary column address information C_A corresponding to data character display locations of a display device having a row/column display field to binary absolute address information, the absolute address information corresponding to each display location being represented by $A=C_A+2^4R_A+2^6R_A$, where C_A has a value between 0 and 79, said data converter comprising:

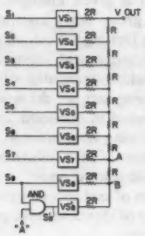
first circuit means operative to receive the binary row information R_A and the binary column information C_A corresponding to each character display location of the display field of the display device and in response thereto to produce binary partial summation information representing a binary summation of two of the three expressions in $A=C_A+2^4R_A+2^6R_A$; and

second circuit means coupled to the first circuit means and operative to receive the binary partial summation information produced by the first circuit means and the binary row information R_A and in response thereto to produce absolute address information representing a binary summation of the partial summation information and the remaining expression in $A=C_A+2^4R_A+2^6R_A$.

4,231,022
INTERPOLATIVE PCM DECODER UTILIZED FOR μ-LAW AND A-LAW

Hiroshi Kosugi, Yokohama; Hirofumi Inoue, Ichikawa, and Hirotoshi Shirasu, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 15, 1978, Ser. No. 969,841
Claims priority, application Japan, Jan. 6, 1978, 53-215
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 DA 3 Claims

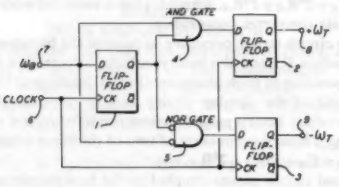


1. In an interpolative PCM decoder having holding means for holding a polarity bit signal, segment selection bit signals and uniform quantization bit signals for one sampling period, means for receiving uniform quantization bit signals from the holding means and expanding the bit signals into a group of 1-bit signals on a time axis, means for adding the signals from the expansion means and the segment selection bit signals, a digital-to-analog converter which generates an analog value of a lower end of each segment, and a logic circuit for the μ-law which receives an output of the addition means and which delivers a selection signal for generating the analog value to cause the output of the digital-to-analog converter to be switched from the lower boundary value of a given segment to the lower boundary value of the next higher segment as a function of time within one sampling period, said interpolative PCM decoder further comprising an AND circuit which receives the selection signal for selecting a minimum unit of the analog value of the lower end of the segment and a control signal for change-over between the μ-law and the A-law, and means for generating the same analog value as the minimum unit of the first-mentioned analog value in accordance with an output of said AND circuit.

4,231,023
BINARY TO TERNARY CONVERTER

Richard C. Warner, Morris Plains, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Mar. 12, 1979, Ser. No. 19,991
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD 3 Claims



1. A circuit for translating ternary data being transmitted in serial binary code on one input line into ternary data coded for binary transmission on two output lines, the input data signalling a first ternary state by means of a signal alternating at an established rate for at least one cycle, a second ternary state by the presence of a signal at a first level for the period of at least one cycle, and a third ternary state by the presence of a signal at a second level for the period of at least one cycle, including

(a) first means for storing the present state of the input signal during each half cycle and providing said state as an output;

(b) first logic means having as inputs the output of said means for storing and said input signal and providing an output when both are at said first level;

(c) second logic means having as inputs the output of said means for storing and said input signal and providing an output when both are at said second level;

(d) second means for storing the state of the output of said first logic means and providing said state as an output;

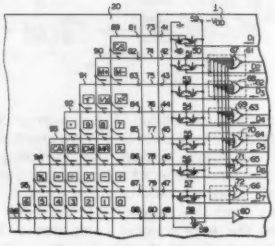
(e) third means for storing the state of the output of said second logic means and providing said state as an output; and

(f) a clock developing a clock signal occurring each half cycle synchronously with said input signal, each of said first, second and third means for storing responsive to said clock signal to store the state at their respective inputs and provide said states at their outputs, whereby, when said input signal remains at said first level for two half cycles, an output will be provided from said second means, when said input signal is at said second level for two half cycles, said third means for storing will provide an output and when said signal alternates between said first and second levels over a cycle, neither of said second and third means for storing will provide an output.

4,231,024
DEVICE FOR A DIGITAL ARITHMETIC PROCESSING APPARATUS

Eiichi Munetsugu, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 12, 1976, Ser. No. 741,504
Claims priority, application Japan, Nov. 14, 1975, 50-136188
Int. Cl.[2] G06F *3/02*
U.S. Cl. 340—365 S 7 Claims



1. A data entry device comprising:

a keyboard device having a first keyboard terminal, at least one second keyboard terminal, and a third keyboard terminal;

a plurality of keyboard switch means for selectively interconnecting said first, second, and third keyboard terminals;

a semiconductor integrated circuit for cyclically providing at least first and second keyboard sampling pulses at different times with respect to each other;

a first terminal pin;

at least one second terminal pin;

a third terminal pin;

a first gate circuit through which said first terminal pin receives said first keyboard sampling pulses;

a second gate circuit through which said at least one second terminal pin receives said second keyboard sampling pulses;

an output-only lead connecting said first terminal pin and said first keyboard terminal for transmitting said first keyboard sampling pulses from said first terminal pin to said first keyboard terminal;

an output/input lead connecting said at least one second terminal pin with said at least one second keyboard terminal, said output/input lead (1) for transmitting a said first keyboard sampling pulse from said at least one second keyboard terminal to said at least one second terminal pin when a said keyboard switch means is selected to interconnect said first keyboard terminal to said at least one second keyboard terminal during the occurrence of a said first keyboard sampling pulse, and (2) for transmitting said second keyboard sampling pulses from said at least one second terminal pin to said at least one second keyboard terminal;

at least one timing-inhibition circuit having an input terminal connected to a said at least one second terminal pin for generating a key select signal only in response to said transmission of a said first keyboard sampling pulse to said at least one second terminal pin; and

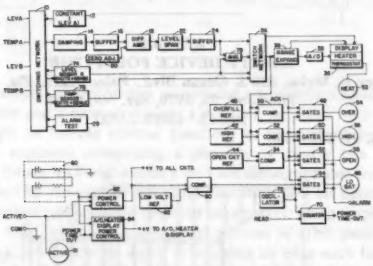
an input-only lead connecting said third keyboard terminal to said third terminal pin for transmitting said first keyboard sampling pulses to said third terminal pin when a said keyboard switch means is selected to interconnect said first keyboard terminal to said third keyboard terminal, and for transmitting said second keyboard sampling pulses to said third terminal pin when a said keyboard switch means is selected to interconnect a said at least one second keyboard terminal to said third keyboard terminal.

4,231,025

LEVEL AND TEMPERATURE READOUT AND ALARM SYSTEM

John H. Turner, Jr., Cambridge, Mass., assignor to Metritape, Inc., West Concord, Mass.

Filed Nov. 1, 1979, Ser. No. 90,392
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—521 **13 Claims**



1. For use with a resistance level and temperature sensor operative to provide a measure of the level and temperature of a fluent material, a readout and alarm system comprising:

a first housing containing:

an intrinsically safe first battery source for powering the circuits in the first housing:

circuit means for excitation of said resistance level sensor and sensing of sensor signal representing fluent material level;

circuit means for excitation of said resistance temperature sensor and sensing of sensor signal representing fluent material temperature;

an analog-to-digital converter;

switching means for selectively coupling the level sensor voltage or temperature sensor voltage to said converter;

a digital display for visually indicating fluent material level or temperature as selected by said switching means;

an alarm circuit for providing a level alarm signal upon sensing of a level sensor voltage which differs from a predetermined threshold;

an alarm level indicator activated by said level alarm signal;

a circuit for sensing low battery voltage of said first battery source and providing a low battery alarm signal;

a low battery indicator activated by the low battery alarm signal of said first battery source;

a circuit for sensing an open circuit condition and providing an open circuit alarm signal;

an open circuit indicator activated by the open circuit alarm signal;

a first terminal connected to said alarm circuit;

a second terminal coupled to electrical ground;

a third terminal connected to the first battery source;

a second housing containing:

an intrinsically safe second battery source for powering the circuits in the second housing;

a circuit for sensing low battery voltage of said second battery source and providing a low battery alarm signal;

a threshold circuit for providing an alarm threshold level;

an audible alarm sounder;

driver circuit means for said alarm sounder including means for causing said sounder to produce a first sound in response to an alarm signal above the alarm threshold level, and a second sound in response to said low battery alarm signal;

a cable coupling said first, second and third terminals to respective fourth, fifth and sixth terminals of said second housing;

the fourth terminal for coupling a received alarm signal to said threshold circuit;

a fifth terminal coupled to electrical ground; and

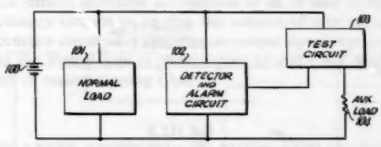
switch means operative to interconnect said fifth and sixth terminals and connect said battery source to electrical ground.

4,231,026

BATTERY DISCHARGE LEVEL DETECTION CIRCUIT

James R. Sullivan, Nanuet, N.Y., assignor to Power Conversion, Inc., Mount Vernon, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,933
Int. Cl.² G08B *21/00*
U.S. Cl. 340—636 **5 Claims**



1. A circuit for detecting the energy level of a long life battery, such as lithium battery, comprising:

means for normally loading the battery at a predetermined current level,

means for periodically increasing the battery load to a current level higher than said predetermined current level,

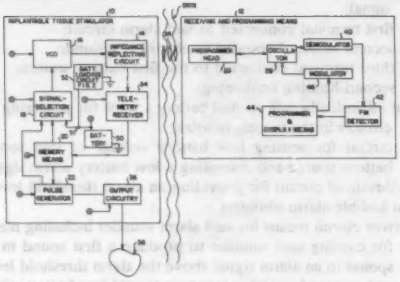
means responsive to said increasing means for detecting a decrease in battery voltage output resulting from the increase in battery load, and

means responsive to said detecting means for establishing an alarm condition at the time said decreased battery voltage is detected, said increasing means including means for generating a pulse train of a predetermined frequency, means for counting down the pulse train, means responsive to the counting means for generating an enabling pulse, and means responsive to said enabling pulse for increasing the battery load.

4,231,027
BATTERY MONITORING MEANS FOR AN IMPLANTABLE LIVING TISSUE STIMULATOR

Brian M. Mann, Northridge, and Russell R. Beane, Sepulveda, both of Calif., assignors to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Feb. 28, 1979, Ser. No. 16,200
Int. Cl.³ A61N *1/36*; G08B *21/00*; G01N *27/46*
U.S. Cl. 340—636 **6 Claims**

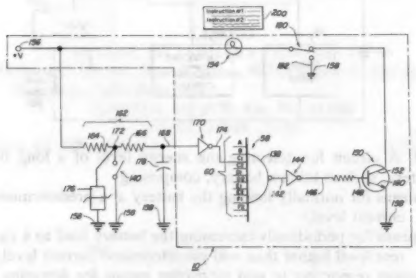


1. In an implantable living tissue stimulator powered by a battery and having a telemetry means for transmitting and receiving signals related to the operation of said tissue stimulator, a battery monitoring means comprising:
- means for providing said battery output voltage to said telemetry means;
- load means for altering current through said battery; and
- means for connecting said load means to said battery thereby altering said battery output voltage by an amount related to the internal impedance of said battery.

4,231,028
READY INDICATOR FOR HIGH-VOLTAGE SWITCHGEAR

John A. Zulaski, Mount Prospect, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 3, 1978, Ser. No. 957,275
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—644 **12 Claims**

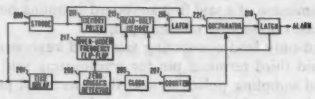


1. A ready indicator for switch-gear usable in a high-voltage electrical system; the switch-gear being of the type having an interrupter switch in a normal first position, the switch being selectively movable to a second position by a switch operator selectively energized by a selectively actuable control device responsive to electrical conditions of the system, the indicator comprising
- first means for generating a first signal if the switch is in the first position;
- second means for generating a second signal if the switch operator is capable of moving the switch to the second position;
- third means for generating a third signal if the control device is capable of energizing the switch operator; and
- first indicating means for producing a human-sensible indication of the simultaneous generation of the signals.

4,231,029
AUTOMATIC TRANSFER CONTROL DEVICE AND FREQUENCY MONITOR

Paul M. Johnston, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 706,975, Jul. 19, 1976, Pat. No. 4,090,090.
This application Feb. 28, 1978, Ser. No. 881,926
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—658 **12 Claims**

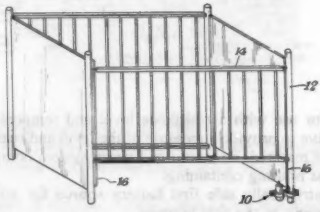


1. Apparatus for monitoring the frequency of an alternating current power source, comprising:
- means for measuring the frequency of said source during each cycle;
- means having an address input and a data output for storing a plurality of limit values;
- means connected to said measuring means and said storage means for comparing measured and stored values;
- means connected to said comparing means for generating an alarm signal when a measured value falls outside a limit value;
- and means connected to said storage means for selecting alternate limit values to present to said comparing means on alternate cycles, whereby alternate testing functions are performed on alternate cycles.

4,231,030
SAFETY DEVICE FOR A CRIB

Mary G. Weiss, 530 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Jan. 23, 1979, Ser. No. 6,261
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—686 **1 Claim**



1. A safety device for an infant's crib having a crib gate and useful in combination thereof to provide a visual indication and background illumination when the crib gate is in a down, unlocked position, comprising:
- a housing;
- an electrically actuated light source mounted within said housing;
- an electrical power source mounted within said housing and connected to said light source;
- a mechanically actuated spring biased switch mechanically connected through said housing and electrically con-

nected between said power source and said light source, said spring biasing the switch in an off position such that when said switch is mechanically moved from said bias off position to a second position said light source will be actuated, said light source being disposed at one end of said housing and said switch being disposed at the opposite end of said housing; and

a bracket having the first portion connected to said housing and a second portion connected to a crib leg adjacent said movable gate, said housing being disposed relative to said crib gate whereby said switch is actuated whenever said crib gate is in a down position.

4,231,031

REMOTE CONTROL SYSTEM CAPABLE OF TRANSMITTING THE INFORMATION WITH THE AID OF AN INFRA RED BEAM USING PPM OR AN ULTRASONIC BEAM USING PDM

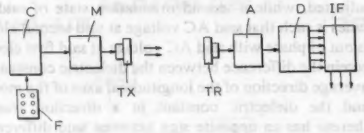
Gerald O. Crowther, Sutton; Terence A. Douglas, Banstead, and Howard M. Farmer, Selsdon, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 875,338, Feb. 6, 1978. This application Apr. 7, 1978, Ser. No. 894,245

Claims priority, application United Kingdom, Feb. 9, 1977, 5300/77

Int. Cl.[2] H04B *7/00, 11/00;* H03K *13/24*

U.S. Cl. 340—695 **9 Claims**



1. A remote control system comprising a transmitter having an encoder and a receiver having a decoder, in which each of a plurality of remote control functions is represented by a message sequence comprising a plurality of binary bits of which a binary bit 0 and a binary bit 1 are distinguishable from each other by having, for the whole duration of a bit period, different time ratios of two different parameters, being respectively a high level and a low level portion of a bit period, forming a pulse duration signal comprising an edge each time the said signal is changing from one level to the other, said message sequence being repeated at least twice by said transmitter, wherein in order to be able to use the same encoder at the transmitter side and the same decoder at the receiver side both for ultrasonic and infra-red transmission of said binary bits, the encoder comprises means for converting, in the case of infra-red transmission, said pulse duration signal into a pulse position modulation signal whereby a data pulse is transmitted on each edge of said pulse duration signal, and wherein the decoder comprises means for reconstituting, in case of infra-red transmission, the received pulse position modulation signal into the original pulse duration signal and wherein the encoder further comprises an extra pulse generator for generating an additional pulse (EP) which is transmitted between alternate message sequences whereby each alternate message sequence is inverted when decoded by said decoder to ensure that, in the event of undesirable initial message sequence inversion in the decoder, a correct message sequence is received at least once.

4,231,032

VARIABLE ACCURACY TREND GRAPH DISPLAY APPARATUS

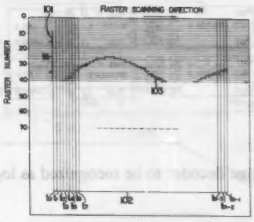
Toshitaka Hara, and Nagaharu Hamada, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 7, 1978, Ser. No. 940,367

Claims priority, application Japan, Sep. 9, 1977, 52-107720

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—703 **6 Claims**



1. A graph display apparatus comprising:

a CRT display unit of raster scanning type;

a raster counter counting the number of scanned rasters to identify the raster number of the scanning line presently scanning the display screen of said CRT display unit;

at least two graph display units each including a memory having a capacity corresponding to the number of time points on the time axis extending in the scanning direction of the raster on the display screen of said CRT display unit for storing the raster numbers corresponding to the levels of the quantities to be displayed at the individual time points, and a comparator comparing the output of said counter with the output of said memory read out sequentially in timing relation with the individual time points for providing a coincidence detection signal output only when coincidence is reached between the output of said counter and the output of said memory;

a variable accuracy circuit associated with each of said graph display units for receiving the output of said associated graph display unit thereby providing a display signal output at the timing of scanning of selected number of dots among a plurality of dots corresponding to one time point; and

an OR circuit provided in common to all of said variable accuracy circuits to receive the outputs of said variable accuracy circuits for applying an output signal representing the logical sum of these inputs to said CRT display unit of raster scanning type.

4,231,033

LOGIC LEVEL SHIFTERS AND THEIR APPLICATION IN LUMINOUS DISPLAY CIRCUITS

Alexandre Paphitis, Rua Djalma Ulrich 57, Apt. 1006, Copacabana, 20.000 Rio de Janeiro ZC-37, Brazil

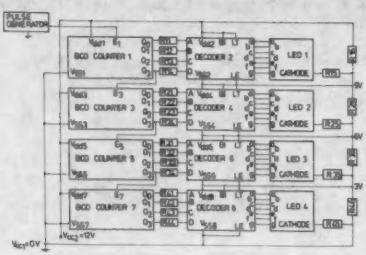
Filed Sep. 11, 1978, Ser. No. 940,812

Int. Cl.[3] G09G *3/14*

U.S. Cl. 340—762 **5 Claims**

1. A multi-stage luminous display circuit, each stage comprising a driver having binary outputs, a decoder connected to said driver outputs and having a plurality of outputs, and a luminous display device having the same said plurality of electrodes of a first relative polarity and at least one electrode of a second relative polarity, said plurality of electrodes being connected to said decoder outputs and said at least one electrode being connected to the power input terminal of the decoder of an adjacent stage so that said display devices are effectively connected in series through said decoders, the power supply potentials of each said driver being so related to the power supply potentials of its associated same stage de-

coder that the logic one and logic zero signals produced on said driver outputs lie within the ranges of safety and tolerance



of said same stage decoder to be recognized as logic ones and zeros.

4,231,034

DISPLAY DEVICE FOR ILLUSTRATING VARIABLE AND FIXED INFORMATION

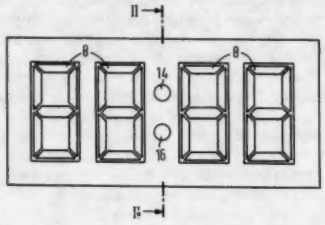
Martin Bechteler, Ortsteil Heimstetten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,018

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823845

Int. Cl.[2] G02F *1/13*

U.S. Cl. 340—765 **10 Claims**



1. A liquid crystal cell display device for illustrating variable and fixed information characters, said cell comprising two carrier plates enclosing a medium therebetween which can be switched between optically different states, said fixed information characters being at least partially provided by spacers located between said two carrier plates and being optically contrasting against their surroundings.

4,231,035

LIQUID CRYSTAL DISPLAY FOR LARGE TIME MULTIPLEXING FACTORS

Cornelis Z. van Doorn, and Jacobus J. M. J. DeKlerk, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,325

Claims priority, application Netherlands, Oct. 27, 1977, 7711775

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—784 **3 Claims**

1. A display device comprising

a liquid crystal display structure including a first cover plate, a liquid crystal having dielectric relaxation, a second cover plate, and sealing means for enclosing said liquid crystal between said first and second cover plate;

a plurality of first electrodes disposed on said first cover plate at a side facing said liquid crystal, and a plurality of second electrodes disposed on said second cover plate at a side facing said liquid crystal;

a plurality of display elements each formed by a portion of said liquid crystal located between a first electrode of said plurality of first electrodes and a second electrode of said plurality of second electrodes;

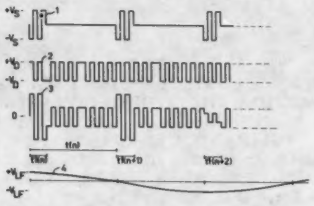
auxiliary optical means for making visible orientation states of groups of molecules of said liquid crystal;

first generating means for generating a high-frequency first AC voltage;

second generating means for generating a low-frequency second AC voltage;

selection circuit means for sequentially coupling said first generating means to always at least one of said first electrodes;

control circuit means for coupling said first generating means to said second electrodes;



coupling circuit means for continuously coupling all of said display elements to said second generating means; and

means for controlling the AC voltage applied to one of said first electrodes at one of said display elements to be in phase with the AC voltage applied to said second electrode corresponding to said one display element so that a first orientation state of molecules of said liquid crystal is adjusted, while a second orientation state of said molecules is such that said AC voltage at said second electrode is out of phase with said AC voltage at said first electrode;

wherein the difference between the dielectric constant in the average direction of the longitudinal axes of the molecules and the dielectric constant in a direction transverse thereto has an opposite sign between said difference for said high frequency first AC voltage and that for said low frequency second AC voltage.

4,231,036

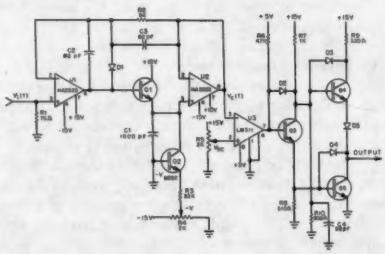
BLIP SCAN ANALYZER

Roger H. Peabody, Kings Park, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1977, Ser. No. 789,393

Int. Cl.[3] G01S *7/22*; H03K *3/017*

U.S. Cl. 343—5 EM **2 Claims**



1. A device for improving target detection and identification in a signal processing system comprising:

means for providing a plurality of variable amplitude echo signals representing target information; and

means responsive to said signals for forming a two-dimensional amplitude pattern representing a target wherein said amplitude pattern is formed as a plurality of illuminated line segments with each segment extending from a target range for a length proportional to an individual echo signal amplitude, said means for forming the two-dimensional amplitude pattern comprising,

a charging circuit coupled to receive each of said variable amplitude echo signals and provide a voltage output for each received signal,

a discharge circuit coupled to receive each voltage output and discharge said voltage at a given rate,

a threshold circuit coupled to said voltage output for providing a threshold signal when said voltage output is above a predetermined threshold,

means responsive to said threshold signal for providing a constant amplitude pulse having a pulse width equal to the time that the voltage exceeds said threshold, and

means responsive to each of said pulses for forming the line segments.

4,231,037

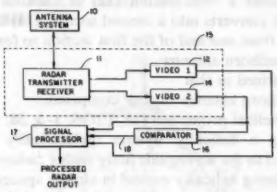
RADAR CLUTTER SUPPRESSOR

Maurice W. Long, 1036 Somerset Dr., NW., Atlanta, Ga. 30327

Continuation-in-part of Ser. No. 797,197, May 16, 1977, abandoned. This application Feb. 23, 1978, Ser. No. 880,624

Int. Cl.[2] G01S *13/00*

U.S. Cl. 343—5 CE **37 Claims**



1. A radar clutter suppressor comprising:

a first means for providing at least three different carrier frequencies;

a second means for providing at least three received signals representing said carrier frequencies wherein for each one of said carrier frequencies there is a particular one of said received signals representing said one of said carrier frequencies;

a third means for providing at least three video signals in response to said received signals, wherein for each one of said received signals there is a particular one of said video signals responsive to said one of said received signals;

comparator means for comparing the magnitudes of said video signals, by pairs, and for providing an output only when the ratio of the magnitudes of each pair of at least two pairs of said received signals is a ratio within one of a plurality of predetermined ranges of ratios, and each of said plurality of predetermined ranges of ratios includes unity ratio;

processing means responsive to said output for providing clutter suppressed radar output and for indicating the presence of a target in the presence of said output.

4,231,038

DOPPLER RADAR DEVICE

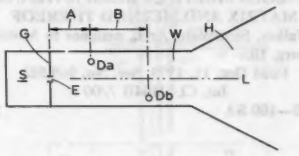
Kenneth Holford, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1979, Ser. No. 6,063

Claims priority, application United Kingdom, Feb. 9, 1978, 05240/78

Int. Cl.[3] G01S *13/56*

U.S. Cl. 343—5 DD **8 Claims**



1. Apparatus for use in a Doppler radar or the like comprising a length of waveguide having a reflective termination at one end, means at said one end for introducing microwave energy into the waveguide and two mixer diodes arranged within and spaced apart along the waveguide so that energy to be transmitted can flow in one direction along the waveguide past the diodes to the other end of the waveguide and return energy reflected from a target can flow past the diodes in the opposite direction, the mixer diodes being spaced apart along the axis of the waveguide by a distance $(2n+1)\lambda/4+\gamma\lambda$ where n is zero or a positive integer, λ is the wavelength at the designed operating frequency and γ is a factor which compensates for the effect of the diodes on propagation within the guide and wherein the distance along the axis of the waveguide between the termination and the mixer diode nearer thereto is substantially $(2m+1).\lambda/8$ where m is zero or a positive integer.

4,231,039

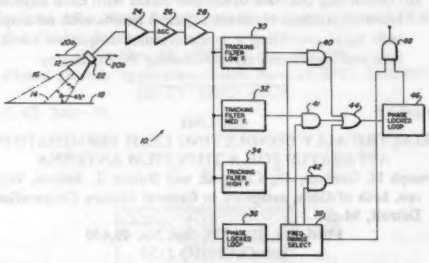
RADAR SPEEDOMETER

Jack D. Fritzlen, Vail, and James L. Witler, Avon, both of Colo., assignors to Glymar, Vail, Colo.

Filed Dec. 28, 1978, Ser. No. 973,942

Int. Cl.[2] G01S *9/44*

U.S. Cl. 343—8 **21 Claims**



1. Apparatus for measuring the speed of a vehicle moving over a fixed surface comprising:

first means adapted to be mounted on the vehicle for transmitting a narrow beam of microwave energy toward the surface at a predetermined angle with respect to the direction of travel of the vehicle, for receiving microwave energy reflected from the surface, and for producing an output Doppler frequency spectrum which is a function of the speed of the vehicle;

signal processing means responsive to all signals in the Doppler frequency spectrum and outputting a normalized

Doppler spectrum having a number of signals of different amplitudes and frequencies; and

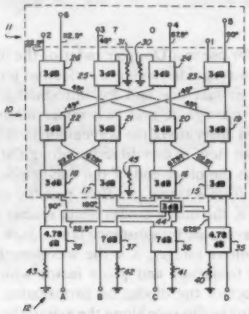
second means to which the normalized Doppler spectrum is applied for producing an output signal which is the weighted mean of the normalized Doppler spectrum and which is substantially a predetermined function of the speed of the vehicle with respect to the surface.

4,231,040

SIMULTANEOUS MULTIPLE BEAM ANTENNA ARRAY MATRIX AND METHOD THEREOF

Scott H. Walker, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 11, 1978, Ser. No. 968,583
Int. Cl.³ H04B 7/00
U.S. Cl. 343—100 SA **13 Claims**



1. In a simultaneous multiple beam antenna array matrix including a Butler matrix having $3^m.2^n$ input ports and $3^m.2^n$ output ports, where m and n are any whole positive integer either of which may include zero, a method of maximizing the power output for a predetermined side lobe level comprising the steps of:

(a) shifting the phases of signals at the $3^m.2^n$ output ports in a fixed phase progression of approximately 180° divided by the number of output ports to locate one multiple beam approximately along the array axis; and

(b) combining portions of the one beam with each adjacent beam to produce resultant adjacent beams with an amplitude taper providing a predetermined amplitude of side lobe and approximately maximizing the efficiency.

4,231,041

ELECTRICALLY CONDUCTING LEAD TERMINATION APPARATUS FOR A THIN FILM ANTENNA

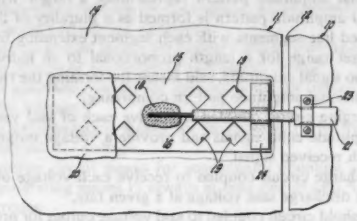
Joseph H. Graeser, Jr., Cortland, and Robert J. Adkins, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 18, 1979, Ser. No. 49,440
Int. Cl.² H01Q 1/50
U.S. Cl. 343—767 **1 Claim**

1. Apparatus for connecting an antenna lead conductor to a non-solderable, electrically conducting antenna member, the apparatus comprising, in combination:

a strip of electrically conducting solderable tape fixed to the antenna member with an adhesive material which may be an insulator, the strip being adapted to receive the lead conductor soldered thereto and provided with one or more cutout openings therethrough, whereby inner edges are provided, the total strip edge length is increased and inner openings to the antenna member are created; and

a coating of electrically conducting paint over the strip and cutout openings, the coating providing electrical connection between the strip and the antenna member through



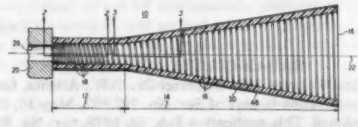
the cutout openings and providing environmental protection for the apparatus.

4,231,042

HYBRID MODE WAVEGUIDE AND FEEDHORN ANTENNAS

Richard H. Turrin, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 22, 1979, Ser. No. 68,621
Int. Cl.³ H01Q 13/02
U.S. Cl. 343—786 **12 Claims**



1. A hybrid mode feedhorn antenna comprising:

a hollow waveguide body including an inner surface and comprises a first section (**12**) of uniform cross-section which converts into a second section (**14**) that flares outward from one end of the first section to form a mouth of the feedhorn antenna

characterized in that

the feedhorn antenna further comprises:

a spiro-helical projection (**18**, FIGS. **1–3**; **38**, FIG. **4**) comprising a helically wound dielectrically coated wire bonded to the waveguide body with a dielectric layer, said wire being helically wound in closely spaced turns which abut one another starting at the end of the first section further from the second section and covering a first portion (II-IV, FIG. **2**; **30**, FIG. **4**) of the inner surface of the first section in a manner capable of providing a smooth transition for a TE_{11} mode signal propagating therethrough, the helical windings continuing in a second portion (V, FIG. **2**; **32**, FIG. **4**) of the first section adjacent said first portion with turns which gradually have the spacing therebetween increased in a linear manner which is capable of converting the TE_{11} mode of a signal propagating therethrough into a HE_{11} mode, and the helical windings continuing in the remaining portion of the feedhorn antenna with a uniform pitch.

4,231,043

TECHNIQUE FOR REDUCING NEAR-IN SIDELOBES OF AN OFFSET ANTENNA

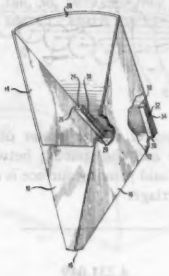
Ralph A. Semplak, Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 22, 1979, Ser. No. 68,731
Int. Cl.³ H01Q 13/02, 19/13
U.S. Cl. 343—786 **5 Claims**

1. An antenna comprising:

an offset main reflector (20) including a reflecting surface and a focal point associated therewith; and

absorbing material means (24, 32 in FIG. 1; 40 in FIG. 3; 41, 60 in FIG. 5; 70, 80 in FIG. 7) disposed on the reflecting surface of the main reflector capable of reducing sidelobes



CHARACTERIZED IN THAT

the means capable of reducing sidelobes comprises at least one piece of absorbing material disposed only on an edge portion of a sector of the reflecting surface of the main reflector closest to the focal point of said reflector.

4,231,044

POSITIONING AND ORIENTING A MOBILE EQUIPMENT CARRIER FOR AN ANTENNA MAST

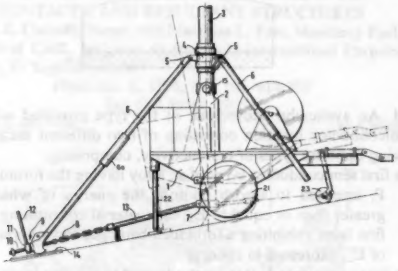
Otto Henkel, Delmenhorst, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,044

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742431

Int. Cl.³ H01Q *1/32, 1/08*

U.S. Cl. 343—881 **5 Claims**



1. Structure for setting up, positioning and orienting a mobile equipment carrier, comprising:

a support structure on the carrier, establishing two vertically spaced support locations;

at least three legs, having their upper end hinged to said support structure at an upper one of the two locations; and

tension elements adjustable as to their length and being with one end each affixed to said support structure at a lower one of the locations, and further affixed with their respective other end to portions of the legs near respective lower ends thereof so that the lower ends of the legs can be individually pivoted towards the carrier by shortening individually the effective lengths of the tension elements, permitting lifting of the support structure to thereby lift the carrier off the ground.

4,231,045

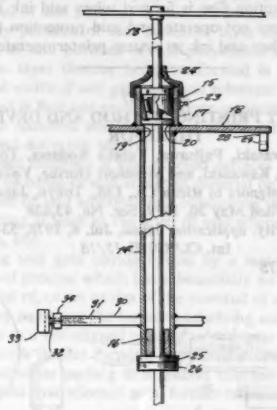
WEATHER PROOF RADIO TOWER BEARING ASSEMBLY

Orrin E. Ingles, 5004 N. Graceland Dr., Peoria, Ill. 61614

Filed Jul. 30, 1979, Ser. No. 61,600

Int. Cl.³ H01Q *3/04*

U.S. Cl. 343—882 **2 Claims**



1. A weather proof, radio tower, bearing assembly, comprising in combination a tubular housing through which a shaft extends having an antenna on its upper end, a tapered upper bearing supporting an upper end of said shaft, and a bronze lower bearing in a lower end of said housing supporting a lower end of said shaft rotatably free, and means for support of said housing on the legs of said radio tower, wherein said means comprises a triangular plate affixed to an upper end of said housing, and stub shafts at corners of said plate engaging said posts, wherein said means further comprises sideward arms from a lower portion of said housing for bearing against sides of said legs, and wherein a boot and case enclose said tapered bearing.

4,231,046

INK ISSUANCE ORIFICE PROTECTION IN AN INK JET SYSTEM PRINTER

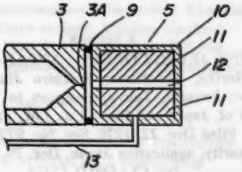
Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 13, 1978, Ser. No. 960,030

Claims priority, application Japan, Nov. 14, 1977, 52137002

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. In an ink jet system printer of the charge amplitude controlling type which emits ink droplets from an orifice formed in a nozzle, charges said ink droplets by a charging tunnel in accordance with print information, deflects said charged ink droplets as they pass through a constant high-voltage electric field, and deposits said charged, deflected ink droplets on a

record receiving member, thereby printing desired symbols on said record receiving member, the improvement comprising:

film formation means incorporated in said charging tunnel for selectively forming a protection film in front of said orifice in order to isolate said orifice from the ambience; and

drive means for activating said film formation means so that said protection film is formed when said ink jet system printer does not operate, and said protection film is removed when said ink jet system printer operates.

4,231,047

INK-JET PRINTING METHOD AND DEVICE THEREFOR

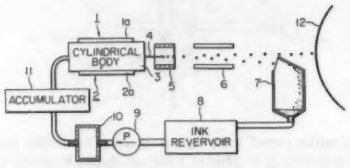
Kyuhachiro Iwasaki, Fujisawa; Yutaka Kodama, Tokyo; Koichiro Jinnai, Kawasaki, and Masanori Horike, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,638

Claims priority, application Japan, Jul. 6, 1978, 53-68527

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. An ink-jet printing method of the type including the steps of imparting ultrasonic vibrations to the pressurized ink so as to cause the ink jet to emerge through a nozzle and break into a train of ink drops equally spaced apart from each other in time in flight and using a charge electrode and a pair of deflection electrodes in such a way that said ink drops may be selectively steered to travel to strike against a recording medium or to a gutter, CHARACTERIZED by providing an ink drop generator with a first ultrasonic transducer and a second ultrasonic transducer so as to impart the ultrasonic vibrations to the pressurized ink,

energizing normally said first ultrasonic transducer in such a way that the formation of each ink drop or breakup of the ink jet into each ink drop may be so timed that each ink drop may be charged or not charged when only said first ultrasonic transducers is energized or when both said first and second ultrasonic transducers are energized simultaneously in response to the ink-placement signal de-energizing or energizing said second ultrasonic transducer, whereby the formation of each ink drop may be so timed as to cause said each ink drop to be not charged or to be charged thereby steering the uncharged or charged ink drop so as to strike against said recording medium.

4,231,048

INK JET RECORDING APPARATUS

Masanori Horike, Yokohama; Koichiro Jinnai, Tokyo, and Kyuhachiro Iwasaki, Tokyo, assignors to Yutaka Kodama, Tokyo, all of, Japan and Ricoh Co., Ltd., Japan

Filed Dec. 22, 1978, Ser. No. 972,325

Claims priority, application Japan, Dec. 29, 1977, 52/160314

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **13 Claims**

1. An ink jet recording apparatus comprising:

an ink reservoir;

printing head means provided with a plurality of ink jet nozzles connected to said ink reservoir;

a printing surface having a center of curvature for supporting a sheet thereon; and

a carriage movably supporting said printing head and said ink reservoir for movement toward and away from said printing surface;

said ink jet nozzles being arranged such that ink is ejected

radially with respect to the center of curvature of the printing surface and the spacing between said printing head means and said printing surface is adjusted by movement of said carriage.

4,231,049

HETEROJUNCTION PHOTODIODE OF THE AVALANCHE TYPE

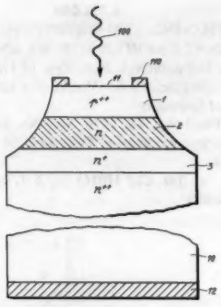
Thomas Pearsall, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 7, 1978, Ser. No. 958,385

Claims priority, application France, Nov. 10, 1977, 77 33916

Int. Cl.² H01L *29/90, 29/14*

U.S. Cl. 357—13 **3 Claims**



1. An avalanche photodiode of the type provided with a semiconductor junction consisting of two different materials having opposite types of conductivity, comprising:

a first semiconductor layer of an alloy having the formula In P, intended to absorb photons the energy of which is greater than or equal to E_1, the material constituting said first layer exhibiting a forbidden band gap having a width of E_2, expressed in energy;

a second semiconductor layer adjacent to the first layer, and formed of an alloy having the formula

$$Ga_xIn_{1-x}As$$

wherein x=0.47 within a few thousandths, said second layer exhibiting a forbidden band gap having a width of E_3, expressed in energy;

a monocrystalline substrate having the formula In P;

said semiconductor junction being formed by said first layer having a first type of conductivity, which is strongly doped, and said second layer having an opposite type of conductivity, less doped than the first layer, the energies E_1, E_2 and E_3 complying with the following double relationship:

$$E_1 > E_2 \geq 2E_3.$$

4,231,050

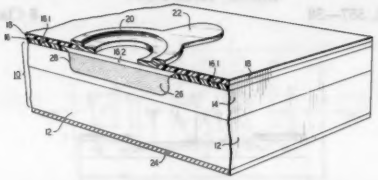
REDUCTION OF SURFACE RECOMBINATION CURRENT IN GAAS DEVICES

Horace C. Casey, Jr.; Alfred Y. Cho, both of Summit, and Philip W. Foy, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 30, 1979, Ser. No. 7,790

Int. Cl.³ H01B *29/161*

U.S. Cl. 357—16 **8 Claims**



1. A GaAs device with reduced surface recombination current comprising

a monocrystalline GaAs body (**10**) having a localized zone (**26**) of conductivity different from adjacent portions of said body,

a monocrystalline layer (**16**) of oxygen-doped AlGaAs on a major surface of said body, said AlGaAs layer having a low resistivity central portion (**16.2**) in substantial registration with said zone and a semi-insulating peripheral portion (**16.1**) surrounding said central portion,

a dielectric passivation layer (**18**) covering said peripheral portion of said AlGaAs layer,

a first electrical contact (**20**) to said central portion of said AlGaAs layer, and

a second electrical contact (**24**) to said body.

4,231,051

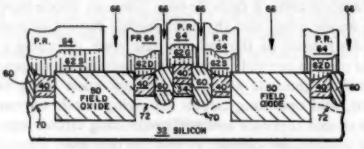
PROCESS FOR PRODUCING MINIMAL GEOMETRY DEVICES FOR VSLI APPLICATIONS UTILIZING SELF-ALIGNED GATES AND SELF-ALIGNED CONTACTS, AND RESULTANT STRUCTURES

Frank Z. Custode, Norco, and Matthias L. Tam, Monterey Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 6, 1978, Ser. No. 913,258

Int. Cl.² H01L *29/78*

U.S. Cl. 357—23 **10 Claims**



1. A process for providing a self-aligned contact to the gate of a field effect device having source, gate and drain regions and formed on a predetermined area of a silicon semiconductor substrate, said gate comprising a gate electrode formed on a gate dielectric in turn formed on the gate region, said gate region extending across said predetermined area generally centrally thereof and defining said source and drain regions in the remaining portions of said selected area, comprising the steps of:

forming an oxide layer of greater width than said gate and extending across said predetermined area covering said gate region,

forming a layer of polysilicon at least over said oxide layer,

forming a silicon nitride layer on said polysilicon layer extending over said selected area of said substrate,

selectively removing portions of said silicon nitride layer so as to define a remaining silicon nitride gate button extending across said predetermined area in alignment with said oxide layer and of the width of said gate,

removing portions of the polysilicon layer exposed by the removal of said portions of said nitride layer and removing any portions of said dielectric layer exposed by removal of said portions of said polysilicon layer, said dielectric layer thereby being conformed in width to the desired width of said gate, and said substrate surface being exposed in first and second portions respectively underlying the removed portions of said silicon nitride, polysilicon, and dielectric layers,

doping said substrate at said exposed surfaces thereof,

forming an oxide of said substrate material on said exposed portions of said substrate and contiguous with said gate, extending at least to the level of said silicon nitride gate button, and

removing said gate nitride button by a material selective removal process which has substantially no effect on the material of, or on oxides of the material of said substrate, thereby to expose the surface underlying said gate nitride button as a self-aligned contact to said gate electrode;

said process further forming a diffused conducting line in said substrate surface in a second selected area isolated from said first selected area, further comprising the steps of:

simultaneously applying said layer of polysilicon over said second selected area,

simultaneously providing a silicon nitride layer over said polysilicon layer over said second selected area,

simultaneously delineating said silicon nitride button overlying said polysilicon layer in said second selected area at a desired position,

simultaneously removing the portions of the polysilicon layer over said second selected area exposed by removal of said silicon nitride layer thereby to retain only that portion of said polysilicon layer over said second selected area underlying said diffused conducting line contact button thereby to expose the corresponding underlying portion of said substrate in said second selected area,

simultaneously oxidizing said exposed surface portion of said substrate in said second selected area, and

simultaneously removing said diffused conducting line nitride button to expose the underlying surface of said remaining polysilicon layer portion and afford thereby a self-aligned contact to said diffused conducting line.

4,231,052

APPARATUS FOR PARALLEL-IN TO SERIAL-OUT CONVERSION

Derek J. Day, and Charles T. Elliot, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 2, 1978, Ser. No. 956,960

Claims priority, application United Kingdom, Nov. 4, 1977, 45995/77

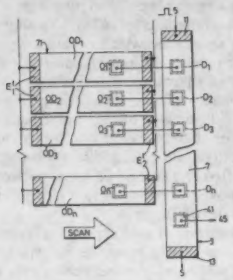
Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **10 Claims**

1. A transfer device for converting information in parallel form to information in serial form comprising:

a substrate of semiconductor material capable of sustaining spatial distribution of ambipolar carriers; first and second current electrodes formed on the subtrate a spaced distance apart; detector means situated between the current electrodes for detecting a parameter dependant upon a local density of ambipolar carriers when current is applied between the current electrodes, and the ambipolar carriers are caused to drift towards the detector means; and a plurality of inputs situated between the first current elec-

trode and the detector means, for injecting information carriers into an active region of the subtrate between the



electrodes, and for enabling thereby the accumulation of the spatial distribution of ambipolar carriers.

4,231,053

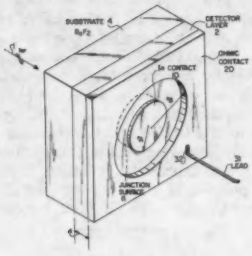
HIGH ELECTRICAL FREQUENCY INFRARED DETECTOR

Richard B. Schoolar, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 771,717, Feb. 24, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,217

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **60 Claims**



1. A photovoltaic detector, comprising:

an electrically insulating substrate of an alkali-halide;

an epitaxial layer twelve hundred or less Angstrom units thick of semiconductor material having a first type conductivity, deposited on said substrate;

the material selected from the group consisting of:

lead chalcogenides,

cadmium chalcogenides,

or mixtures thereof:

two major surfaces being, respectively, the top and the substrate-mating surfaces of said layer;

a rectifying contact disposed on an area coplanar with one of said major surfaces when said layer is at about room temperature;

a region formed in situ by the induced field of the rectifying contact;

the region having a second and opposite type conductivity; and

a P-N junction formed by the contiguous surfaces of said region and said layer.

4,231,054

THYRISTOR WITH STARTING AND GENERATING CATHODE BASE CONTACTS FOR USE IN RECTIFIER CIRCUITS

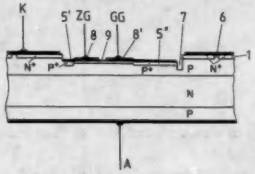
Christian Ruetsch, Turgi, and Roland Sittig, Umiken, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

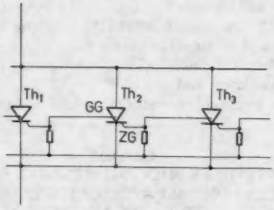
Filed May 22, 1979, Ser. No. 41,332

Claims priority, application Switzerland, Jun. 15, 1978, 6522/78

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **8 Claims**





1. An output thyristor connected to an operating circuit and fired by a controlling circuit, said thyristor having at least four semiconductor zones of alternating conductivity type, including a cathode zone, a cathode-base zone, an anode-base zone and an anode zone, said thyristor further having at least two electrodes formed on the cathode base zone, including a starting gate used to control firing of said thyristor and a generator gate used to generate an output current upon firing of said thyristor, said operating circuit supplying anode current and voltage to said thyristor and said controlling circuit supplying starting voltage and current to said starting gate, comprising:

said thyristor having a lateral resistance $R_{GK'}$ between the generator gate and the cathode zone thereof formed such that while conducting an anode current smaller than a surge limit of said thyristor, sufficient current is removable from said generator gate such that said output thyristor can be adapted to ignite a corresponding thyristor connected in parallel therewith by application of the removable current from the output thyristor to a starting gate of the corresponding thyristor; and

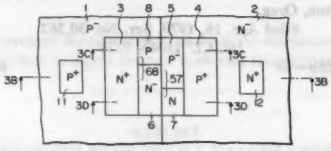
said output thyristor having a lateral resistance R_{GK} between the starting gate and cathode zone sufficiently small, with $R_{GK} < R_{GK'}$, so that a starting voltage applied to the starting gate thereof acts directly on the semiconductor junction between the cathode and the cathode base zones.

4,231,055

COMPLEMENTARY MOS TRANSISTORS WITHOUT AN ISOLATION REGION

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 3, 1978, Ser. No. 957,443
Claims priority, application Japan, Nov. 16, 1977, 52/137649; Nov. 16, 1977, 52/137650; Nov. 22, 1977, 52/140204
Int. Cl.[2] H01L *27/02, 29/78*
U.S. Cl. 357—42 **10 Claims**



1. A complementary metal-oxide-semiconductor (MOS) transistor comprising one of a semiconductor substrate and a semiconductor region provided on an insulating substrate, which includes a first semiconductor region of a first conductivity type and a second semiconductor region of a second conductivity type formed adjacent to said first semiconductor region; a third semiconductor region of the second conductivity type provided on said first semiconductor region; a fourth semiconductor region of the first conductivity type provided on said second semiconductor region; a first channel region formed between said first semiconductor region and said fourth semiconductor region and having a subregion with a prescribed conductivity type having a specified impurity concentration; a second channel region formed between said second semiconductor region and said third semiconductor region and having a subregion with a prescribed conductivity type having a specified impurity concentration; a fifth semiconductor region of the second conductivity type provided in a portion of said first channel region and adjacent to the subregion of said second channel region; a sixth semiconductor region of the first conductivity type formed in a portion of said second channel region and adjacent to the subregion of said first channel region; and gate electrode means positioned above said first and second channel regions through an insulation layer for controlling said first and second channel regions; an MOS transistor of the first channel type of said complementary MOS transistor including said fourth semiconductor region, the subregion of said first channel region and said sixth semiconductor region; an MOS transistor of the second channel type of said complementary MOS transistor including said third semiconductor region, the subregion of said second channel region and said fifth semiconductor region.

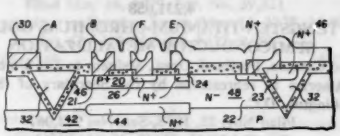
4,231,056

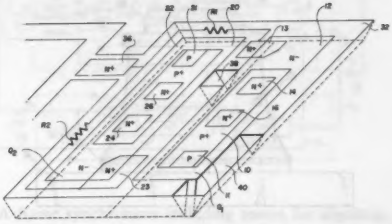
MOAT RESISTOR RAM CELL

David L. Taylor, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 20, 1978, Ser. No. 953,137
Int. Cl.[2] H01L *27/04, 27/12, 27/02*
U.S. Cl. 357—50 **17 Claims**

1. An integrated semiconductor structure comprising:
a body of semiconductor material;
a first transistor having an emitter region, a base region and a collector region formed in said body;
a second transistor having an emitter region, a base region and a collector region formed in said body;
dielectric walls isolating laterally said first and second transistors from each other;
a polycrystalline semiconductor moat surrounding the lateral walls of said first and second transistors and isolated therefrom by said dielectric walls and forming a pair of resistors;
means for selectively interconnecting the regions of said first and second transistors and said polycrystalline moat resistors; and





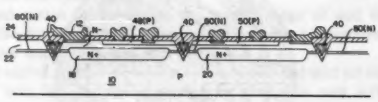
said polycrystalline moat being discontinuous to define said pair of resistors being connected at one end to a common point in said moat and disconnected at their other ends to prevent a low resistance path between the regions of said first and second transistors which are interconnected to a respective moat resistor.

4,231,057

SEMICONDUCTOR DEVICE AND METHOD FOR ITS PREPARATION

Yoshinobu Momma, Sagamihara; Yunosuke Kawabe, Yokohama, and Osamu Hataishi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1978, Ser. No. 960,228
Int. Cl.[3] H01L *27/04*
U.S. Cl. 357—50 **10 Claims**



1. A semiconductor device comprising:
a semiconductor substrate having a first conductivity type;
a plurality of buried layers of a second conductivity type opposite to said first type formed in selected portions of the surface of said semiconductor substrate an epitaxial layer of said second conductivity type formed over said semiconductor substrate and said layers;
a plurality of isolation regions formed between adjacent ones of said buried layers, said isolation regions extending downward from the surface of said epitaxial layer to said semiconductor substrate;
an epitaxial layer of said second conductivity type formed over said semiconductor substrate and said buried layers;
a plurality of first regions having said first conductivity type formed in said epitaxial layer corresponding to said buried layers, each said first region extending to respectively contact said isolation regions; and
a plurality of second regions having said second conductivity type formed between said semiconductor substrate and said epitaxial layer, and between said isolation regions and

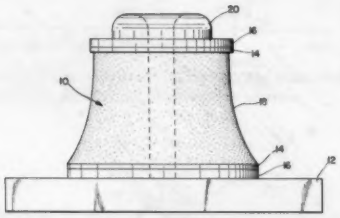
said buried layers, said second conductivity type regions having higher conductivity than that of said epitaxial layer and have a depth shallower than the deepest portion of the buried layers.

4,231,058

TUNGSTEN-TITANIUM-CHROMIUM/GOLD SEMICONDUCTOR METALLIZATION

K. Reed Gleason, Portland, Oreg., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1978, Ser. No. 963,067
Int. Cl.³ H01L *23/48, 29/46, 29/62*
U.S. Cl. 357—67 **6 Claims**



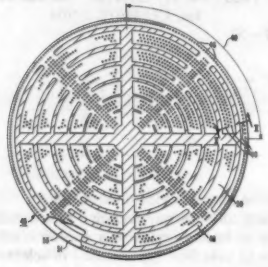
1. An improved diode in which the improvement comprises: a metallization layer of an alloy of chromium, titanium and tungsten on silicon followed by a layer of gold.

4,231,059

TECHNIQUE FOR CONTROLLING EMITTER BALLAST RESISTANCE

Philip L. Hower, Pittsburgh, and Derrick J. Page, Murrysville Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,813
Int. Cl.² H01L *23/48*
U.S. Cl. 357—68 **16 Claims**



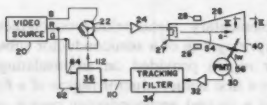
1. A transistor comprising:
(a) a body of semiconductor material having first and second substantially flat opposed surfaces and an edge extending therebetween, said body of semiconductive material including an emitter region, a base region and a collector region, portions of said emitter and base regions extending to said first surface and said collector region extending to said second surface;
(b) a collector electrode affixed to said collector region;
(c) a base electrode affixed to said base region;
(d) an emitter electrode; and
(e) an emitter metallization comprising a plurality of non-abutting metallized regions affixed to said emitter region, said emitter metallization forming an electrical connection between said emitter region and said emitter electrode with the number and area of said metallized regions being selected such that said transistor has a desired effective emitter resistance.

4,231,060

COLOR-PULLING COMPENSATION IN A BEAM-INDEX DISPLAY TUBE

Robert G. Culter, Seattle, Wash., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 16, 1979, Ser. No. 30,262
Int. Cl.² H04N *9/24*
U.S. Cl. 358—69 **6 Claims**



1. A beam-index display system comprising:
(a) means for receiving first and second video drive signals representative respectively of first and second differentiable characteristics of an image to be produced;
(b) a beam-index cathode-ray tube including a display medium, means for produing an electron beam, and means for directing said beam toward said medium;
(c) means for causing said electron beam to sweep across said display medium;
(d) means associated with said beam-index cathode-ray tube for producing a control signal representative of the position of said electron beam relative to said display medium;
(e) means for comparing the magnitude of said first drive signal with that of said second drive signal;
(f) means responsive to said comparison of said drive signals for shifting the phase of said control signal an amount proportional to the results of said comparison;
(g) means responsive to said shifted control signal for sequentially selecting said drive signals for application to said beam-producing means of said beam-index cathode-ray tube; and
(h) means for modulating the current density of said electron beam in accordance with the magnitudes of said selected drive signals.

4,231,061

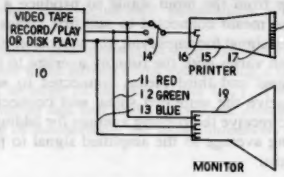
INSTANT COLOR SLIDE RECORDER OF CRT IMAGE

Samuel Freeman, 13 Birchwood Ct. East, Syosset, N.Y. 11791

Filed Apr. 9, 1979, Ser. No. 28,199
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **9 Claims**

1. An instant "daylight" system of recording a hard-copy film reproduction of any still image displayed on the faceplate of a cathode-ray tube, comprising a monitor cathode-ray tube with a visible display of a still image, means to apply to a second cathode-ray tube the same video signal(s) as applied to said first monitor cathode-ray tube, said second cathode-ray tube with electron-gun means for optimum electron-beam

density and with optimum ultraviolet-emitting phosphor means deposited on a fiber-optic faceplate means having optimum ultraviolet-transmissivity, and ultraviolet-sensitive film means exposed in direct contact with said faceplate means.

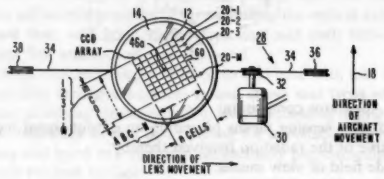


4,231,062

CHARGE-COUPLED DEVICE IMAGER SYSTEM

Max W. Stewich, Chelmsford, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1978, Ser. No. 964,387
Int. Cl.³ H04N 3/15, 7/18
U.S. Cl. 358—109 **3 Claims**



1. A system for providing electronic signals representing an image of an object, said system comprising in combination:

means for producing relative motion between said object and said system in a first direction such that the distance between said system and said object remains substantially invarient;

a charge-coupled device array comprising m columns, each of n elements, each column being coupled to an output terminal where $m>1$ and $n>1$;

a lens positioned between said array and said object such that said array is in the focal plane of said lens;

means for producing relative motion between said lens and said array such that said array remains in the focal plane of said lens and said object is scanned in a second direction normal to said first direction such that points on said object along an imaginary line lying on said object in said second direction are imaged along the elements of a given array column, each of said points being imaged on each of said elements of said given column in succession, points along imaginary lines parallel to said first imaginary line being similarly imaged on various elements of various other columns of said array associated with said imaginary lines; and

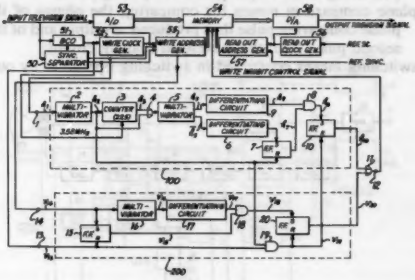
means coupled to said array for electronically translating signals contained in the elements thereof in respective columns from one element to the next along said respective columns at the same rate and direction that the image moves along said array such that a given point of said object is imaged serially on successive elements in a given column as a signal representative of said given point is stored in said successive elements, said direction that said image moves being toward the output terminals such that said electronic signals are translated thereto.

4,231,063

FRAME SYNCHRONIZER HAVING A WRITE-INHIBIT CIRCUIT

Yutaka Ito; Yuzo Inoue; Takao Shimizu; Masao Inaba; Atsumi Sugimoto, and Takeo Emori, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 16, 1979, Ser. No. 39,321
Claims priority, application Japan, May 19, 1978, 53-60228
Int. Cl.³ H04N 5/04, 5/22, 9/46
U.S. Cl. 358—148 **5 Claims**



1. A frame synchronizer including means for digitizing an input television signal, a memory for storing the digitized television signal, write-in address generator means for generating address signals to write the digitized television signal in said memory in accordance with a scanning sequence of the input television signal, read-out address generator means for generating address signals to read the digitized television signal out of said memory in accordance with a reference signal, means for converting the signal read out of said memory into an analog signal, and means for producing a write-inhibit signal to inhibit the write-in of said digitized television signal into said memory, said write-inhibit signal producing means comprising

first means responsive to one of the synchronizing pulses contained in said input television signal for generating a first pulse disposed at a time position before the time position of the synchronizing pulse immediately following said one synchronizing pulse;

a flip-flop adapted to be set by the leading edge of said first pulse and to be reset by said synchronizing pulses of said input television signal;

second means responsive to the trailing edge of said first pulse for generating a second pulse having a narrower pulse width than said first pulse; and

third means responsive to said second pulse and said set state of said flip-flop for providing an output as said write-inhibit signal.

4,231,064

VERTICAL SYNCHRONIZATION CIRCUIT FOR A CATHODE-RAY TUBE

Tomoaki Uchida, Iwai, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed May 15, 1979, Ser. No. 39,333
Claims priority, application Japan, May 18, 1978, 53-65787[U]; May 18, 1978, 53-65788[U]
Int. Cl.² H04N 5/04
U.S. Cl. 358—158 **5 Claims**

1. A vertical synchronization circuit comprising:

means for separating a horizontal synchronizing signal and a vertical synchronizing signal from a composite video signal introduced as input;

oscillation means for oscillating and generating, in response to the horizontal synchronizing signal thus separated, clock pulses of a frequency of repetition which is an even-number multiple of the horizontal scanning frequency;

a first counter for counting the clock pulses thus generated and producing as output a first pulse when the pulse count becomes a predetermined number correlated to the ratio of the horizontal scanning period and the vertical scanning period of the composite video signal;

a waveform shaping circuit supplied with the vertical synchronizing signal thus separated and the clock pulses thus generated and producing as output a second pulse, which is synchronized with the clock pulses, every time the vertical synchronizing signal is supplied as input;

means for shaping the first pulse from the first counter and producing as an output phase comparing pulse;

phase comparison means for comparing the phases of the phase comparing pulse thus produced as output and of the second pulse from the waveform shaping circuit;

switching means controlled in switching operation by output pulses of the phase comparison means and thereby carrying out the operation of selectively producing as output the second pulse out of the first and second pulses and supplying the second pulse to the first counter thereby to place the first counter in a first reset state when the phases of the two input pulses supplied to the phase comparison means are not continuously coincident during a specific vertical scanning period and the operation of selectively producing as output the first pulse and supplying the same to the first counter thereby to place the first counter in a second reset state when the phases of two input pulses supplied to the phase comparison means are continuously coincident in specific vertical scanning periods; and

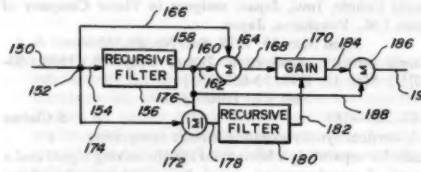
means for shaping pulses produced as output from the first counter and synchronized with the vertical synchronizing signal.

4,231,065

LOCAL AREA CONTRAST ENHANCEMENT DEVICE

Robert C. Fitch, Roseville, and Patrenahalli M. Narendra, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1979, Ser. No. 2,489
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **8 Claims**



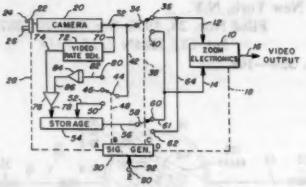
1. A system for providing local area contrast enhancement of an input signal comprising two dimensional recursive filter means connected to receive the input signal for producing a running average of the input signal, first means connected to receive the input signal and connected to said recursive filter means to receive the running average for subtracting the running average from the input signal to produce a subtracted signal, second means connected to said first means to receive the subtracted signal for amplifying the subtracted signal by an amount which varies with the running average to produce an amplified signal and third means connected to said second means to receive the amplified signal and connected to said first means to receive the running average for adding a portion of the running average to the amplified signal to produce an enhanced signal.

4,231,066

ELECTRONIC ZOOM SYSTEM IMPROVEMENT

John Merchant, Needham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 12, 1979, Ser. No. 2,832
Int. Cl.³ H04N 3/22, 5/26
U.S. Cl. 358—180 **10 Claims**



1. Apparatus comprising:

radiation sensing means providing an output signal indicative of the radiation received thereby;

wide field of view means;

narrow field of view means;

means mounting said wide field of view means and said narrow field of view means in first and second interchangeable positions with respect to said radiation sensing means so as to direct radiation from a scene being viewed to said radiation sensing means;

changing means operable to interchange said wide field of view means and said narrow field of view means;

storage means having an input connected to receive and store the output of said radiation sensing means and to produce an output representative of the stored output of said radiation sensing means; and

connective means connecting the output of said radiation sensing means to a first output connection while connecting the output of said storage means to a second output connection when said wide field of view means is in the first interchangeable position and connecting the output of said radiation sensing means to the second output connection while connecting the output of said storage means to the first output connection when said narrow field of view means is in the first interchangeable position.

4,231,067

TELEVISION IMAGE PROJECTION APPARATUS

Henry J. Jewell, Belleair, and Richard L. Meyer, Largo, both of Fla., assignors to Viewpoint, Inc., Largo, Fla.

Filed Oct. 30, 1978, Ser. No. 955,884
Int. Cl.² H04N 5/74
U.S. Cl. 358—237 **16 Claims**

1. A unit for supporting a television receiver housing and projecting an image from the face of a CRT thereof to a remote, reflective viewing screen, said unit comprising:

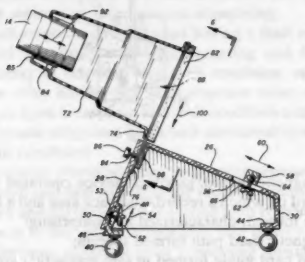
(a) a base having a top wall upon which said CRT is placed defining a planar support surface with front, rear and side edges, said front and rear edges being horizontally dis-

posed and said side edges being inclined upwardly from said rear to said front edge;

(b) a stop member having a forward edge parallel to said front edge and adjustably positionable with respect thereto;

(c) a projection lens mounted in a unitary lens barrel;

(d) a hollow hood having a first end defining a first opening at least as large as the face of the CRT of the receiver supported by said unit, and a second end defining a second opening of substantially the same dimensions as said lens barrel and adapted to frictionally engage said lens barrel for adjustable positioning thereof along the optical axis of said lens, said hood defining an enclosed path between said first and second openings; and



(e) means for attaching said hood to said base with said first opening arranged adjacent to and above said front edge, said attaching means including means extending below the bottom edge of said first opening for adjustably positioning said hood in a direction substantially perpendicular to said support surface.

4,231,068

OPTICAL SCREENS

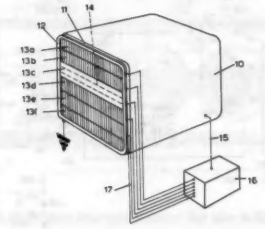
Geoffrey H. Hunt, Farnham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 12, 1978, Ser. No. 914,771

Claims priority, application United Kingdom, Jun. 15, 1977, 25090/77

Int. Cl.[2] H04N *5/72*

U.S. Cl. 358—252 **13 Claims**



1. An optical screen for use with a cathode ray tube having a display face and a raster, comprising a series of parallel strips aligned with the writing direction of said raster, each of said parallel strips comprising a layer of electro-optical substance, and means for sequentially varying a voltage applied across said strips so that each strip is transparent when said raster is writing behind it and becomes light absorbent when said raster is not writing behind it.

4,231,069

METHOD AND APPARATUS FOR PRODUCING IMAGE COMBINATIONS

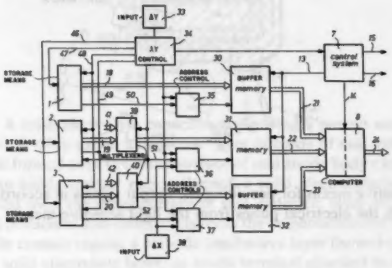
Klaus Wellendorf, Kitzberg near Kiel, and Ruediger Sommer, Raisdorf, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,878

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720944

Int. Cl.[3] H04N *1/00, 1/38*

U.S. Cl. 358—256 **13 Claims**



1. A method for the production of image combinations of a master wherein the image data of the images to be copied into each other are stored in digital memories, and a mask is produced from one of the images for superimposing and copying the images and said mask is scanned, comprising the steps of forming and storing intermediate recordings true to register and scale from first and second images to be combined, forming a mask signal from the second image to be inserted into the other image and forming said mask of a size of the second image to be copied, scanning the second image to be copied and storing the information; eliminating the image data located outside the mask, but within the data inventory of the second image to be copied under control of the mask signal; placing the masked intermediate second image recording on the intermediate recording of the first image into which it is to be copied, and shifting it into the proper position; measuring the shiftings in scanning direction and transversely to the scanning direction, that is in x and y direction to obtain measured Δx and Δy values; and combining the Δx and Δy values with the stored data of the first image with the stored second image data of the other image to form a total image.

4,231,070

HIGH SPEED COPYING MEANS AND METHOD

Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

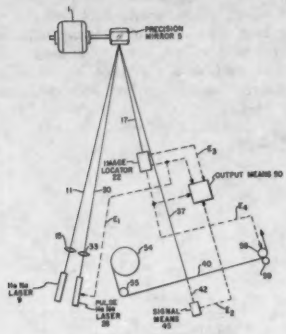
Filed Dec. 7, 1978, Ser. No. 967,327

Int. Cl.[2] H04N *1/04, 1/36, 1/02*

U.S. Cl. 358—285 **7 Claims**

1. Apparatus for providing output signals corresponding to a copy comprising a first laser emitting a beam of light, a mirror having a plurality of faces is spacially related to the first laser so that the light beam is reflected by the mirror when it is rotating in a manner so as to perform a scanning operation, means for rotating the mirror at a predetermined rate, image locator means spacially related to the copy and to the mirror for providing control pulses in accordance with the scanning of the light beam, a second laser spacially related with the first laser and the mirror and connected to the image locator means provides pulses of light which strike the surface of the mirror at the same point that the light beam strikes and is reflected therefrom to impinge upon the copy, light sensitive means spacially related to the copy for receiving pulses of light from

the copy and providing electrical pulses on a one-for-one basis with received light pulses, and means connected to the light



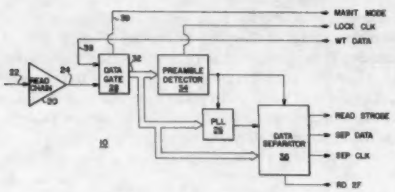
sensitive means for providing the output signals in accordance with the electrical pulses from the light sensitive means.

4,231,071

READER FOR DATA RECORDED ON MAGNETIC DISKS AT PLURAL DENSITIES

Albert L. Anderson, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 17, 1978, Ser. No. 925,534
Int. Cl.[3] G11B *5/09*
U.S. Cl. 360—40 **19 Claims**



1. In apparatus for reading data from a rotating magnetic disk whereon binary data has been recorded on a plurality of data fields, the data being recorded on each data field at a known density rate selected from among a set of substantially differing density rates, and wherein a control signal is provided to select the density rate for reading data from each field, the improvement comprising:

said control signal comprising, for each data field, a density-selection signal selected from among a plurality of available signals, each of which represents one of the available density rates of the set; and

means responsive to the control signal for reading each data field at the density rate represented by the density-selection signal for that field, the density rate for reading each data field thereby being independent of the density rate for reading each other data field,

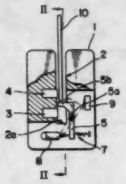
whereby any combination of data fields on a disk record may be read in any arbitrary, desired order, in a single pass over the disk, regardless of the density rate variations from one data field to another.

4,231,072

RECORD/PLAYBACK DEVICE FOR MAGNETIC RECORDING

Akira Toyama, Shimosuwa, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shimosuwa, Japan

Filed Mar. 24, 1978, Ser. No. 889,802
Claims priority, application Japan, Mar. 30, 1977, 52-39168[U]; Sep. 8, 1977, 52-120889[U]
Int. Cl.[2] G11B *5/80, 19/16, 25/04*
U.S. Cl. 360—88 **19 Claims**



1. Magnetic record/playback device operated by the magnetic card on which a record/playback area and a timing signal area are formed, characterized by comprising:

a magnetic card path formed therein;

a fixed card guide formed in said magnetic card path;

a movable card guide, located at a specific distance from said fixed card guide, which can pop in or out of said magnetic card path;

a read-only magnetic head, located facing said magnetic card path over the entering position of said movable card guide;

a write-only magnetic head located facing said magnetic card path below the entering position of said movable card guide; and

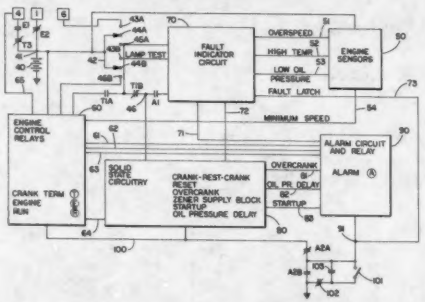
a popping means to pop in or out said movable card guide.

4,231,073

AUTOMATIC IMPROVED ENGINE CONTROL SYSTEM CONTAINING BOTH SOLID STATE CIRCUITS AND RELAYS

Adam J. Suchko, 636 N. Oakland Ave., Indianapolis, Ind. 46201

Filed Nov. 8, 1978, Ser. No. 958,825
Int. Cl.[3] H02H *3/04*
U.S. Cl. 361—1 **21 Claims**



1. In an automatic engine controller for monitoring and controlling the operation of an internal combustion engine including:

(a) start means for activating the start of the engine;

(b) shutdown means for activating the shutdown of the engine;

(c) cranking module means for activating and deactivating said start means and including a solid state oscillator circuit which cycles on and off during crank mode;

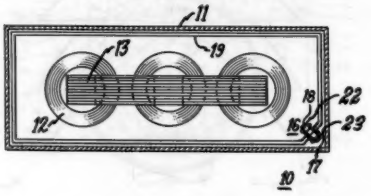
(d) an overcrank module means for responding to an overcrank condition and deactivating said start means when the engine does not start within a specified time and including a solid state circuitry;
(e) a supply battery having a first and a second terminal;
(f) a first switch;
(g) a second switch;
(h) a common electrical point;
(i) fault sensors connecting to the first terminal of said battery; and
(j) a fault response circuit means for activating said shutdown means in response to a fault condition and containing fault sensors; an improvement comprising:
(k) said fault response circuit means having a fault response relay and associated means for operating said fault response relay in response to a fault condition, said fault response relay having first fault response relay contacts which are open in response to a fault condition and second fault response relay contacts which are closed in response to a fault condition;
(l) said common electrical point connecting separately (1) through said first switch to the second terminal of said battery and (2) through said second fault response relay contacts to the second terminal of said battery;
(m) said common electrical point connecting separately (1) through said cranking module and through said overcrank module to the first terminal of said battery and (2) through said sensors and through said fault response relay to the first terminal of said battery; and
(n) said fault response relay connecting to a terminal of said battery through said second switch.

4,231,074

ZERO SEQUENCE CURRENT SOURCE FOR TRANSFORMER HAVING A NONWOUND TERTIARY

William J. McNutt, Pittsfield, Mass., and James R. Wilson, Cincinnati, Ohio, assignors to General Electric Company, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,235
Int. Cl.³ H02H *3/08, 7/04*
U.S. Cl. 361—44 **12 Claims**



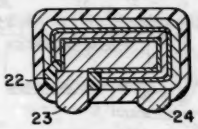
1. A zero sequence current source for use with transformers comprising:
a nontertiary autotransformer within a casing and having primary and secondary windings arranged around a core;
an auxiliary conductor within the transformer proximate said casing and surrounding both said core and said windings for intercepting zero sequence flux from the core and the windings during an external ground fault occurrence; and
a current transformer surrounding a part of the auxiliary conductor for sensing zero sequence current.

4,231,075

SOLID ELECTROLYTE CAPACITOR

Koichi Morimoto, and Tatsuo Tokumaru, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 763,660, Jan. 28, 1977, Pat. No. 4,097,985.
This application Apr. 3, 1978, Ser. No. 892,871
Claims priority, application Japan, Jan. 30, 1976, 51/9064
Int. Cl.³ H01G *9/00*
U.S. Cl. 361—433 **3 Claims**



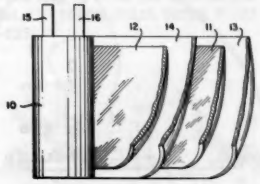
1. A solid electrolyte capacitor comprising a porous anode body of valve-metal, a dielectric layer of oxide of said valve-metal formed over the entire surface of said anode body except for an anode contact region thereof, a solid electrolyte layer formed over the entire surface of said dielectric layer except for a portion of said dielectric layer in the neighborhood of said anode contact region, a cathode conductive layer formed over said solid electrolyte layer, an anode terminal attached to said anode contact region, and an electrically conductive connecting means formed between said anode contact region and said anode terminal, said conductive connecting means being selected from the group of a silver paste, a solder adhesive to ceramics, and a conductive organic polymer.

4,231,076

TANTALUM FOIL CAPACITOR WITH STRONG ACID ELECTROLYTE

Mark Markarian, and Kenneth B. Meyer, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 27, 1978, Ser. No. 945,981
Int. Cl.² H01G *9/00;* **B01J** *17/00*
U.S. Cl. 361—433 **3 Claims**

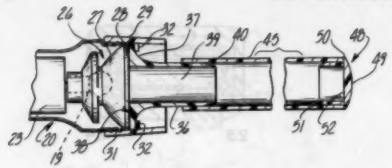


1. A wound tantalum foil electrolytic capacitor comprising an anodized tantalum foil anode, a tantalum foil cathode, a porous chemically-resistant spacer sheet interposed between said anode and said cathode foils and wound contiguous therewith throughout the entire length of said foils, an aqueous 30–40 wt % sulfuric acid electrolyte in contact with said foils and said spacer throughout the winding, said spacer being chosen from the group consisting of microporous polypropylene film, porous perfluoroethylene cloth, polyolefin fiber paper, porous woven polypropylene, polypropylene screen, and porous woven glass cloth, said capacitor having a low equivalent series resistance and increased capacitance per given length of foil.

4,231,077
LIGHT TOY

James E. Joyce, and John P. Joyce, both of 878 Darien Cir., Rochester, Mich. 48063

Filed Dec. 27, 1977, Ser. No. 864,973
Int. Cl.³ F21V 7/09
U.S. Cl. 362—32 16 Claims

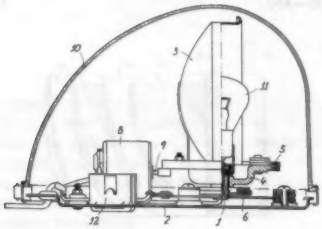


1. A light emitting device comprising:
a flashlight body;
a light source within said body for producing a beam of light;
a light tunnel further comprising a cylindrical hollow, cylindrical tube of lightweight, relatively flexible plastic having non-opaque walls, fastened at one end to said body such that at least a substantial part of the beam of light emanating from said source is directed into the interior of the tube and along the length thereof; and
a reflecting cap with a reflective inner surface fastened to the other end of said light tunnel to reflect said beam back into the interior of the cylindrical tube;
whereby light from said source is emitted through the walls of said light tunnel.

4,231,078
BEAM-ROTARY LAMP

Shozo Hitora, Nara, Japan, assignor to Sasaki Electric Mfg. Co. Ltd., Osaka, Japan

Filed Jan. 3, 1979, Ser. No. 781
Int. Cl.³ F21V 21/30
U.S. Cl. 362—35 10 Claims

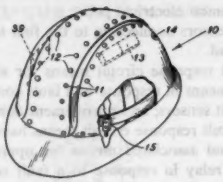


1. A beam-rotary lamp comprising a base; a transparent globe supported on said base and defining therewith an enclosed space; a motor having a driving shaft, said motor being housed within said enclosed space; a support shaft carrying a lamp socket within said enclosed space; a rotor rotatably supported on said support shaft within said enclosed space and having a periphery; a resilient ring positioned about said periphery of said rotor adjacent said driving shaft of said motor; a reflector positioned on said rotor to rotate therewith; at least one magnetic means fixedly attached to said support shaft for providing a magnetic force to bring said resilient ring into firm frictional contact with said driving shaft of said motor.

4,231,079
ARTICLE OF WEARING APPAREL

Stephen R. Heminover, 4032 N. Avers, Chicago, Ill. 60618

Filed Mar. 28, 1979, Ser. No. 24,672
Int. Cl.² F21L 15/14
U.S. Cl. 362—106 8 Claims

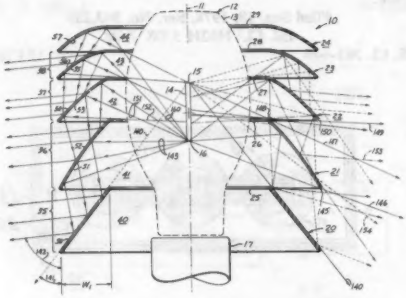


1. A hat assembly comprising, in combination:
(a) a rigid opaque hat having a side exposed to view when worn, and having perforations through said side leading to the space above the head of the wearer;
(b) a series of light emitting diodes of the display type disposed in and projecting through said perforations for being viewed, the terminals thereof being disposed out-of-view;
(c) a battery for powering said diodes; and
(d) control circuitry interconnecting said battery and said diode terminals, said circuitry being adapted to energize said diodes sequentially at a rate to optically simulate motion and including
(1) an electronic clock adapted to emit electrical pulses,
(2) an electronic counter driven by said clock pulses, and
(3) a decoder connecting said counter to predetermined ones of said diodes.

4,231,080
LUMINAIRE WITH REFLECTING LOUVERS

Wayne W. Compton, Irvine, Calif., assignor to Kim Lighting, Inc., City of Industry, Calif.

Filed Mar. 23, 1978, Ser. No. 889,193
Int. Cl.³ A47B 19/00
U.S. Cl. 362—298 6 Claims



1. A luminaire having a vertical axis, and at least four horizontal reflector members, each said reflector member being a surface of revolution around and centered on said axis for at least a substantial portion of its periphery, said portion being coaxial, said reflector members being axially spaced apart from one another, and each having a central opening to receive a lamp which when energized to emit light emits light in a region of major luminance with an upper end and a lower end, said region extending from end to end for a substantial distance along said vertical axis, said reflectors being axially spaced apart to form a first, lower, aperture between a first, lower, one

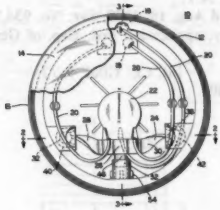
of said reflector members, and the next-above second one of said reflector members, and a second aperture between said second reflector member and the next-above third one of said reflector members, and a third aperture between said third reflectors member and the next-above fourth one of said reflector members, the upper surface of said portion of said first reflector member being specularly reflective and so shaped, disposed, and arranged as to cut off light from the upper end to define the least vertical angle of directly-emitted light, the lower surface of said portion of said second reflector member being specularly reflective, and so disposed and arranged as to reflect light from said region to the said reflecting surface of the first reflector member so that the first reflector member reflects said light in a pattern extending from a maximum vertical angle for light emitted from said lower end, to a lower angle for light emitted from the region above the lower end, and so as to cut off light from the region above the lower end from direct emission above a maximum vertical angle of directly emitted light, the upper surface of said portion of said second reflector member and the lower surface of said portion of said third reflector member being specularly reflective, at least some direct escape of light being permitted between them, with the third reflector so disposed and arranged as to cut off said direct light at or below said maximum vertical angle of directly-emitted light, said last-named upper and lower surfaces sequentially reflecting light from said lower end at the maximum vertical cut-off angle, and from locations above said bottom end, at lesser vertical angles, whereby light emitted from said first and second apertures is a combination of directly emitted and doubly reflected light cut off at said maximum and minimum vertical angles, the inner margin of said third reflector member and the outer margin of said fourth reflector member axially overlapping to prevent direct escape of light from the luminaire, above 90° horizontal, the upper surface of said portion of the third reflector member and the lower surface of said portion of the fourth reflector member being specularly reflective and respectively convex upwardly and concave downwardly, and so proportioned, disposed, and arranged that sequentially reflected light departs at an angle at or beneath said maximum vertical angle.

4,231,081

BULB MOUNT FOR VEHICLE LAMPS

Joseph V. Borruso, Edison, N.J., assignor to Abex Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,360
Int. Cl.³ H01G 1/14
U.S. Cl. 362—306 **6 Claims**



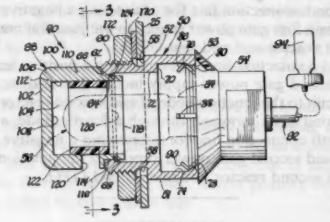
1. A lamp for use in a vehicle subjected to shock and vibration having a rigid reflector, a lens attached to the reflector and cooperative therewith to define a cavity, a flexible bulb support having a central bulb receiving portion, and a bulb in the central receiving portion, characterized by means for resiliently mounting the flexible support in said cavity in the lamp, wherein a reduced amount of vehicle shock and vibration received by the lamp is transmitted to the bulb support since the resilient mounting permits movement of the entire bulb support relative to the reflector whereby the resilient mounting absorbs some shock and vibration and a reduced amount of the shock and vibration received by the bulb support is transmitted to the bulb since flexure of the bulb support absorbs some of the shock and vibration transmitted from the resilient mounting to the bulb support.

4,231,082

LAMP ASSEMBLY LIGHT SHIELD AND RETAINING MEANS

David W. Bull, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Feb. 10, 1978, Ser. No. 876,720
Int. Cl.³ F21S 1/06
U.S. Cl. 362—368 **17 Claims**



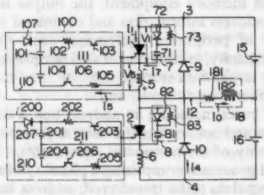
1. A light shield for detachable connection to associated support structure, comprising a shield main body portion, said main body portion comprising a generally relatively forwardly disposed first closed end and a generally relatively rearwardly disposed second end, a recess-like cavity formed in said main body portion, said cavity having an end opening in said second end for receiving at least a portion of an associated bulb means therein, aperture means formed in said main body portion generally transversely thereof as to be located generally between said first and second ends, said aperture means permitting the passage therethrough of light rays generated by said associated bulb means, and light ray filter means, said filter means being situated within said cavity and fixedly secured to and carried by said main body portion in a manner at least partly covering said aperture means.

4,231,083

POWER CONVERSION APPARATUS

Yasuo Matsuda; Kazuo Honda, and Nobuyoshi Muto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 4, 1978, Ser. No. 931,008
Int. Cl.² H02M 7/155; H02H 7/122
U.S. Cl. 363—135 **12 Claims**



1. A power conversion apparatus for converting a D.C. input to an A.C. output, comprising:

first and second input terminals;

first and second gate turn-off thyristors (GTO's) and first and second reactors connected between said first and second input terminals;

an anode of said first GTO being connected to said first input terminal, said first reactor being connected between a cathode of said first GTO and an anode of said second GTO, and said second reactor being connected between a

cathode of said second GTO and said second input terminal;

first and second gate circuits for supplying turn-on currents and turn-off currents to said first and second GTO's, respectively;

a first diode connected in parallel with a first circuit including said first GTO;

a second diode connected in parallel with a second circuit including said second GTO;

an output terminal connected to the junction node of said first reactor and said second GTO;

a first connection line for connecting a positive terminal of a first gate power supply included in said first gate circuit to the junction node of said first reactor and said second GTO, through a third diode;

a second connection line for connecting a negative terminal of said first gate power supply to the junction node of said first reactor and said first GTO;

a third connection line for connecting a positive terminal of a second gate power supply included in said second gate circuit to the junction node of said second reactor and said second input terminal, through a fourth diode; and

a fourth connection line for connecting a negative terminal of said second gate power supply to the junction node of said second reactor and said second GTO.

4,231,084

DATA TRANSFER SYSTEM

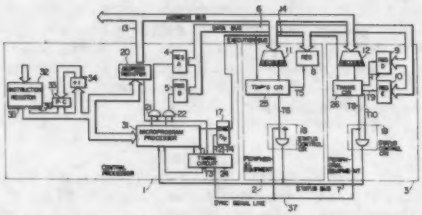
Masaaki Yoshizaki, and Kenichi Mizuno, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 794,116, May 5, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,820

Claims priority, application Japan, May 10, 1976, 51-52225

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—200 **7 Claims**



1. A data transfer system comprising:

a central processor for processing information by fetching and executing an output instruction stored in and read out of a main memory equipment, the output instruction including address information and command information,

a plurality of peripheral equipments each having a data storing capacity, at least one of said peripheral equipments having a larger data storing capacity than that of remaining peripheral equipments, and

a group of buses including an address bus, a data bus and a status bus and connecting the central processor to each of the plurality of the peripheral equipments,

said central processor comprising a plurality of data registers for storing data to be transferred, address transfer means for transmitting to said address bus the address information indicative of one of the peripheral equipments to which the data stored in said data registers is to be transferred, first data transfer means for permitting transmission to said data bus the data stored in one of said data registers in response to a data transfer control signal applied thereto, second data transfer means for operatively permitting transmission to said data bus the data stored in another one of the remaining data registers other than said one data register, said data registers transmitting data repeatedly one after another without changing the address information of said address transfer means due to maintenance of the same output instruction fetched, and means for terminating the data transfer,

said peripheral equipment each comprising means, connected to the address bus to receive said address information transmitted therethrough for judging whether or not said address information designates the associated peripheral equipment, data receiving means for receiving data transmitted through said data bus when the associated peripheral equipment is designated by said address information, said data receiving means having a data storing capacity which corresponds to that of the associated peripheral equipment, and is required for operation of the associated peripheral equipment, and status signal means for judging whether or not the data received by said data receiving means is less than the data required for the operation of the associated peripheral equipment and for generating a status signal indicating that the data received by said data receiving means is less than the data required for the operation of the associated peripheral equipment, said status signal means operating to transmit the thus generated status signal to the status bus for transmission to said central processor,

said second data transfer means being responsive to the status signal transmitted through the status bus and operatively permitting transmission to said data bus the data stored in the another of said plurality of said data registers, and

said terminating means being responsive to the absence of the status signal on the status bus and operatively terminating the data transfer by said first and second data transfer means,

whereby more than one data transfer from the central processor to a selected one of the peripheral equipments is effected by transmission of the status signal from the selected one of the peripheral equipments to said central processor under the same output instruction fetched by said central processor.

4,231,085

ARRANGEMENT FOR MICRO INSTRUCTION CONTROL

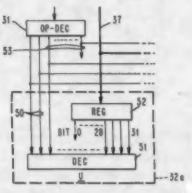
Dieter Bazlen, Stuttgart; Rolf Berger, Schoenaich; Arnold Blum, Gechingen; Dietrich W. Bock; Herbert Chilinski, both of Schoenaich; Hellmuth R. Geng, Herrenberg; Johann Hajdu; Fritz Irro, both of Boeblingen, and Udo Wille, Holzgerlingen, Siegfried Neuber, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,781

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747304

Int. Cl.² G06F *9/12*

U.S. Cl. 364—200 **5 Claims**



1. In a modularly structured data processing system controlled by microinstructions, said system including plural data processing modules, a central source of microprogrammed control signals common to said modules, first bus means having plural bit lines for transferring control bit signals in parallel form from said central source to said modules, a central source of data signals common to said modules, second bus means

having plural bit lines for transferring data bit signals in parallel form from said central source of data signals to said modules, the improvement for selectively transferring additional control bit signals to said modules through selected bit lines in said second bus means which intermittently are not used for transferring data bits, wherein said central source of control bit signals includes a first control store for storing microinstruction words having operation code syllables, first decoding means coupled to said first control store for producing said control bit signals in response to microinstruction word outputs of said first control store, means coupling outputs of said first decoding means to said first bus means for transferral to said modules, comprising:

a decoder internal to each said module for decoding control bit signals to generate control signals for internal control of data bit processing operations in the respective module; and

coupling means internal to each said module for coupling control bit signals to the respective decoder from all of the bit lines in said first bus means, and for coupling additional control bit signals to the respective decoder from said selected lines in said second bus means; each said decoder being responsive to control bit signals coupled thereto by said respective coupling means for operating selectively in first and second modes;

each said decoder being operative in said first mode to decode said control bit signals and additional control bit signals in combination and in said second mode to decode only said control bit signals for generating control signals for controlling the internal data bit processing operations in the respective module.

4,231,086

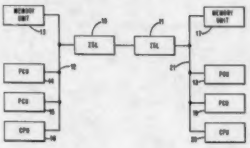
MULTIPLE CPU CONTROL SYSTEM

Bruce H. Tarbox, Billerica, Mass.; Kenneth E. Bruce, Nashua, N.H.; John W. Conway, Waltham, and Ralph M. Lombardo, Jr., Lowell, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Oct. 31, 1978, Ser. No. 956,382

Int. Cl.[3] G06F *9/46, 3/04*

U.S. Cl. 364—200 **1 Claim**



1. A logic system for controlling the access of plural central processing units (CPUs) on a local communication bus to a remote communication bus to avoid CPU deadlocks which may occur when plural CPUs on said local bus issue bus cycle requests requiring the use of same logic flow paths through intersystem link (ISL) units to said remote bus in a data processing system having plural communication busses each providing a common information path for plural data processing units including memory units, peripheral control units, ISL units and CPUs electrically interfacing therewith, and each of said busses are in electrical communication with an ISL unit, and ISL units in turn are in electrical communication in pairs, which comprises:

(a) register means in a local ISL unit in electrical communication with said local bus for storing at the bus rate binary coded information received from said local bus;

(b) bus cycle compare logic means in said local ISL unit and in electrical communication with said register means and said local bus, and responsive to ACK, NAK and WAIT signals received from said remote bus by way of a remote ISL unit for indicating the occurrences of equivalents and non-equivalents between binary coded information stored in said register means and binary coded information on said local bus;

(c) mode control means in said local ISL unit and in electrical communication with said register means and said remote ISL unit for storing a NAK retry bit signal supplied by said local or said remote bus during an ISL configuration mode to indicate the presence of plural CPUs on said local bus; and

(d) NAK logic control means responsive to said non-equivalents and said NAK retry bit signal for issuing a NAK signal to those of said plural CPUs having an access priority higher than that of a lowest priority one of said plural CPUs, thereby providing said lowest priority one CPU with access to said remote bus.

4,231,087

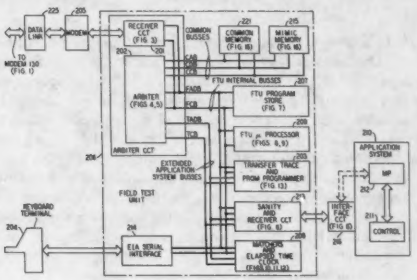
MICROPROCESSOR SUPPORT SYSTEM

Dennis J. Hunsberger, Fair Haven; Charles E. Nahabedian, Mendham; Thomas M. Quinn, Little Silver, and James H. VanOrnum, Hazlet, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1978, Ser. No. 952,278

Int. Cl.[3] G06F *11/00*

U.S. Cl. 364—200 **18 Claims**



1. A processor support system for providing maintenance and software development for an application system which is controlled by an application processor via data, address, and control buses, wherein said processor support system comprises:

computer means for running an operating system to generate and store software for said application system;

field test unit means connected between said computer means and said application system for interfacing said computer means with said application system, wherein said field test unit means comprises:

program store means for storing control instructions generated by said computer means for regulating the operation of said field test unit means;

processor means for controlling the operation of said application system;

memory means for storing said software generated by said computer means and written in said memory means by said computer means;

interface means responsive to said processor means and directly connectable to said application system data, address, and control buses for connecting said application processor to said memory means;

field test unit bus means connected to said program store means and to said processor means for applying said control instructions to said processor means; and

wherein said processor means is responsive to said control instructions for directing said application processor via said interface means to execute said software stored in said memory means.

4,231,088

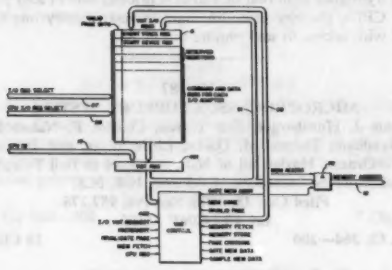
ALLOCATING AND RESOLVING NEXT VIRTUAL PAGES FOR INPUT/OUTPUT

William E. Hammer; David O. Lewis, both of Rochester; John W. Reed, Pine Island; Thomas S. Robinson, and Keith K. Slack, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,656

Int. Cl.[3] G06F *3/00*

U.S. Cl. 364—200 **7 Claims**



1. In a computer system having virtual memory partitioned into pages, an addressable main storage for storing an input-/output (I/O) event stack and in which virtual pages may reside, a central processing unit (CPU) for retrieving I/O events from the I/O event stack and for processing said I/O events, a plurality of I/O adapters connected to control I/O devices and a channel connecting the plurality of I/O adapters to the CPU and main storage, the improvement comprising:

page request means under the control of the I/O adapters for requesting that a particular virtual page be made available in addressable main storage, said page request means specifying channel function information and virtual address information for the requested page;

means responsive to the page request means for forming a page request function event incorporating the channel function information and the virtual address information; and

means for storing the formed page request function event on the I/O event stack.

4,231,089

DATA PROCESSING SYSTEM WITH APPARATUS FOR CORRECTING MICROINSTRUCTION ERRORS

Donald A. Lewine; Thomas M. Dundon, both of Marlborough, and Ronald J. Setera, Leominster, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 15, 1978, Ser. No. 969,956

Int. Cl.[3] G06F *11/16*

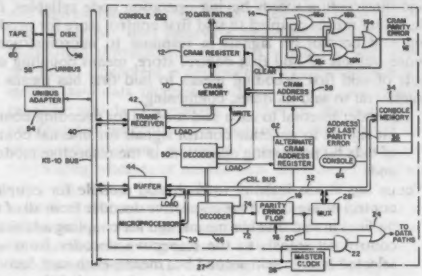
U.S. Cl. 364—200 **10 Claims**

1. Apparatus for correcting instruction errors in a data processing system comprising, in combination:

first and second instruction memory means for storing instructions in memory locations defined by addresses;

register means for receiving and holding instructions from said first and second instruction memory means;

instruction error detection means operable in association with the register means for evaluating an instruction held in said register means to determine whether the instruction is valid or erroneous;



means for freezing the state of at least a portion of the data processing system in response to the detection of an erroneous instruction by the instruction error detection means; and

means operable in response to the detection of an erroneous instruction for replacing the erroneous instruction in said register means with a corresponding valid instruction retrieved from the second instruction memory means.

4,231,090

ELECTRONIC GAME OF ADROITNESS INCORPORATED IN AN ELECTRONIC WATCH

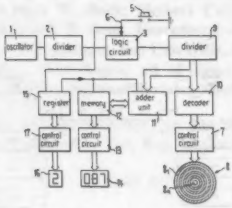
Jean-Claude Fatton, Le Landeron, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Oct. 19, 1977, Ser. No. 843,570

Claims priority, application Switzerland, Nov. 5, 1976, 13958/76

Int. Cl.[2] G04C *3/00*; A63B *7/00*; G08B *23/00*

U.S. Cl. 364—411 **5 Claims**



1. Electronic game of adroitness incorporated into an electronic watch comprising:

electronic circuits for the measurement of time;

display means capable of displaying a plurality of different states;

electronic means in cooperation with at least part of said time measurement circuits for determining a sequence in time of said different states of said display means and repetitively producing said sequence at a rate such that a player can recognize the changes of said different states, said electronic means comprising:

a first control circuit;

a decoder;

a frequency divider, the outputs of which controlling said display means through said decoder and said first control circuit;

a logic circuit normally transmitting pulses delivered by said electronic time measurement circuit to said frequency divider;

a memory;

a first numeric display;

a calculator unit connected to the output of said frequency divider and cooperating with said memory so as to maintain therein a sum of a plurality of individual results;

a second control circuit through which said memory controls said first numeric display capable of indicating said sum;

a second numeric display;

a third control circuit;

a register for determining the choise of a plurality of players, said register controlling said second numeric display through said third control means to indicate the number of the chosen player; and

control means for being actuated by the player of said electronic game for interrupting said sequence of different states according to the instantaneous state of said display means and of the adroitness of the player and which, when actuated, acting on said logic circuit to interrupt the pulses delivered by said electronic time measurement circuits at the output of said logic circuit and according to the chosen player acting at least indirectly through said register upon said memory and said calculator unit.

4,231,091

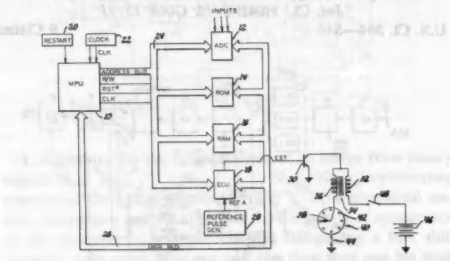
ENGINE CONTROL SYSTEM

Phillip R. Motz, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1978, Ser. No. 963,693

Int. Cl.[3] **G05B** *15/00;* **H03K** *3/017;* **F02B** *5/00*

U.S. Cl. 364—431 **5 Claims**



3. Apparatus for controlling the spark timing of an engine comprising:

means for generating a train of input reference pulses indicative of engine crankshaft position and having a repetition rate proportional to engine speed,

counter means,

clock means operating at a predetermined frequency,

means responsive to said clock means for incrementing said counter means at a submultiple of said predetermined frequency,

read/write memory means responsive to said clock means comprising a RISREF register for storing a binary word corresponding to the content of said counter means when said output should rise, a FALREF register for storing a binary word corresponding to the content of said counter means when said output should fall, an ESTDWELL register for storing a binary word corresponding to the number of counts of said counter means that said output should remain high, an OLDFAL register for storing a binary word corresponding to the number of counts of said counter means that should occur between the fall of said output and the occurrence of a reference pulse, a REFTIME register for storing the content of said counter means upon the occurrence of a reference pulse, a REFPER register for storing a binary word corresponding to the number of counts of said counter means between reference pulses, a NEXR register for storing a binary word corresponding to the predicted content of said counter means at the next reference pulse,

means responsive to engine operating conditions of periodically updating the contents of said OLDFAL and ESTDWELL registers,

means responsive to said clock means for performing arithmetic operations relative to the content of said read/write memory registers and said counter means,

bistable output means responsive to said clock means and said arithmetic means for producing a rectangular wave output signal synchronized with said clock means,

control means responsive to said clock means and including a ROM containing a plurality of subroutines, each subroutine containing one or more instructions, said control means including means responsive to a plurality of inputs for accessing said ROM in response to said inputs or combinations thereof for initiating a subroutine associated with each of said inputs or input combinations, said control means including means responsive to said instructions for controlling data transfers between said counter means, said arithmetic means and said read/write memory means and, for controlling the operation of said arithmetic means and for controlling the state of said output means in accordance with the results of operations of said arithmetic means,

said control means responsive to an input indicative of a rise of said output for initiating a subroutine which updates the content of said FALREF register with the sum of the contents of said OLDFAL and REFTIME registers and which adds the content of said REFPER register thereto a sufficient number of times to cause the content of said FALREF register to be equal to or greater than the content of said counter means,

said control means responsive to a submultiple of said clock frequency and an input indicating that the output has risen for periodically initiating a subroutine which compares the content of said counter means with the content of said FALREF register and which causes the output to fall when the content of said counter means is equal to or greater than the content of said FALREF register,

said control means responsive to an input indicative of a fall of said output for initiating a subroutine which updates the content of said RISREF register with the difference between the content of said ESTDWELL register and the sum of the contents of said FALREF and REFPER registers,

said control means responsive to said submultiple of said clock frequency and an input indicating that said output has fallen for periodically initiating a subroutine which compares the content of said counter means with the content of said RISREF register and which causes the output to rise when the content of said counter means is equal to or greater than the content of said RISREF register,

said control means responsive to a reference pulse for initiating a subroutine which modifies the content of said FALREF and RISREF registers by the difference between the content of said counter means and the content of said NEXR register, which updates the content of said REFPER register by the difference between the content of the counter means and the content of said REFTIME register, which updates the content of said NEXR register by the sum of the content of the counter means and said REFPER register and which updates the content of said REFTIME register with the content of said counter means, and

an ignition circuit responsive to said output signal.

4,231,092
METHOD AND SYSTEM FOR ELECTRONIC SIMULATION OF A FREEWHEEL

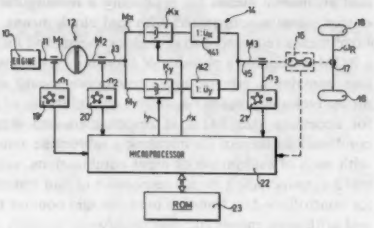
Ferdinand Grob, Besigheim, and Friedrich Rabus, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,355

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755201

Int. Cl.³ G06F *15/20*; G05G *15/08*

U.S. Cl. 364—431 **15 Claims**



1. In the drive system having an engine, driven members, and an automatic transmission having controllable friction coupling means for transmitting torque from said engine to said driven members, a method for simulating freewheel operation, comprising the steps of computing said torque transmitted by said friction coupling means and furnishing a "release" signal when the so-computed torque is equal to zero; and releasing said friction coupling means in response to said "release" signal.

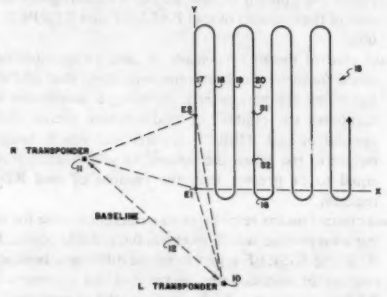
4,231,093
METHOD OF RETURNING TO A LAST POINT IN A PATH AFTER A TEMPORARY DISCONTINUANCE OF AN OPERATION

Cecil N. LaVance, Paradise Valley, and Allan A. Beale, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 11, 1978, Ser. No. 940,914

Int. Cl.³ G06F *15/50*; G01S *5/14, 13/08*

U.S. Cl. 364—460 **2 Claims**



1. In conjunction with an operation of directing a vehicle along a plurality of parallel paths in a predetermined pattern utilizing electronic positioning apparatus, including means for periodically measuring the distance of the apparatus from each of two spaced apart reference stations and periodically calculating the position of the vehicle relative to the two spaced apart reference stations, a method of returning to a last point in a path of the pattern after temporary discontinuance of the operation, comprising the steps of:

(a) defining a coordinate system in conjunction with the predetermined pattern with the paths of the pattern extending generally parallel to a first axis thereof and the second axis lying perpendicular to the paths;

(b) providing continuous indications of deviations of the vehicle from a path parallel to the first axis and continuous indications of distance of the vehicle along the path relative to the second axis using the calculated positions translated into the coordinate system;

(c) temporarily discontinuing the operation of directing the vehicle at a point along the path and leaving the path;

(d) redefining the coordinate system so that a predetermined point therein coincides with the point of discontinuance of the operation;

(e) returning to the approximate area of discontinued operation and using the deviation indications to direct the movement along the path;

(f) providing continuous indications of distance of the vehicle along the path relative to the redefined coordinate system; and

(g) reinitiating the operation as the distance indications coincide with the predetermined point of the redefined coordinate system.

4,231,094
METHOD AND DEVICE FOR DETERMINING THE PHASE INTERCEPT IN A SYSTEM EMPLOYING PHASE-SHIFT KEYING MODULATION

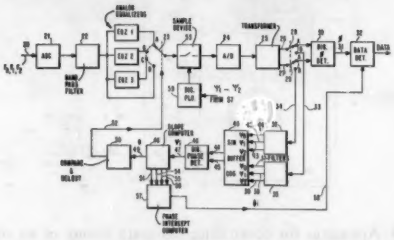
Andre E. Desblache, Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,488

Claims priority, application France, Oct. 27, 1977, 77 33121

Int. Cl.³ H04B *3/46*; G06F *15/31*

U.S Cl. 364—514 **9 Claims**



1. Apparatus for generating a signal from which the phase intercept value of a transmission channel at a given frequency can be determined, comprising:

means for generating a measurement signal for transmission on said channel at a given signaling rate, the measurement signal having components at a given frequency f_o, at a lower frequency $f_1 = f_o - 1/(2T)$ and at an upper frequency $f_2 = f_o + 1/(2T)$ where $1/T$ is the signaling rate;

means for receiving said measurement signal and for extracting therefrom signals proportional to the instantaneous phases of the received signal at the given, upper and lower frequencies, said extracting means further comprising;

means for sampling the received measurement signal at the signaling rate,

transformer means for separating the sampled measurement signal into in-phase and quadrature components,

means for filtering each of said components to derive the in-phase and quadrature components at the given, upper and lower frequencies, and

means for combining the in-phase and quadrature components at each of the frequencies to extract the instantaneous phase signals at each of the frequencies;

means connected to said extracting means for generating a signal proportional to the slope of said channel in the region defined by the upper and lower frequencies as a function of the values of the three instantaneous phase signals and the difference between the upper and lower frequencies; and

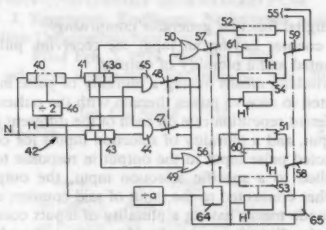
means connected to said generating means for deriving the phase intercept signal as a function of the slope signal, the three instantaneous phase signals, the signaling rate and the given frequency.

4,231,095

REMOTE REPRODUCTION OF IMAGES

Pierre Cassagne, Rueil, France, assignor to MATRA, Paris, France

Filed May 15, 1978, Ser. No. 906,211
Claims priority, application France, May 16, 1977, 77 14985
Int. Cl.³ G06F *15/20*; H04N *7/12*
U.S. Cl. 364—515 **7 Claims**



1. Apparatus for the reconstitution of an image from binary signals $N_{o,o}$, $N_{2,o}$, . . . , $N_{2p,o}$, . . . , $N_{o,2q}$; $N_{2p,2q}$ representing samples of the image distributed over a two-dimensional matrix, comprising a clock at double the frequency of appearance of the elements N, a direct channel comprising a first shift memory with more than one and less than four one bit positions; a delayed channel comprising a cascaded arrangement of a shift register with a number of one-bit positions equal to the number of elements of a complete line of said image line and a second shift memory with a number of one-bit positions equal to those of the first shift memory, means for applying the elements N to said direct channel and delayed channel, clock means synchronized with the frequency of appearance of the elements N for controlling shift of said register and said memories and a set of logic gates connected to said memories to provide, in time alternation, two of the terms m of the following expansion relationship, and then two other terms,

$$m_{2p,2q}=N_{2p,2q}+[N_{2(p+1),2q}\times N_{2p,2(q+1)}],$$

$$m_{2p+1,2q}=N_{2(p+1),2q}+[N_{2p,2q}\times N_{2(p+1),\,2(q+1)}],$$

$$m_{2p,2q+1}=N_{2p,2(q+1)}+[N_{2p,2q}\times N_{2(p+1),2(q+1)}],$$

$$m_{2p,2q+1}=N_{2(p+1),2(q+1)}+[N_{2(p+1),2q}\times N_{2p,2(q+1)}];$$

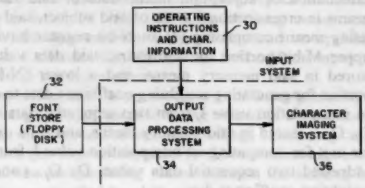
said signals m being representative of samples distributed over a matrix homothetic with that of the samples represented by the signals N, and buffer-registers connected to receive said terms in sequence.

4,231,096

DIGITAL TYPESETTER

Walter I. Hansen, Cold Spring Harbor; Wiley E. Galbraith, East Northport; Louis C. Vella, Selden, and Martin M. Cohen, Scarsdale, all of N.Y., assignors to Eltra Corporation, Toledo, Ohio

Filed Oct. 10, 1978, Ser. No. 950,242
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—523 **44 Claims**



1. A typesetter for the automatic generation of characters comprising, in combination:

(a) input means for providing first digital data specifying the identity, form, size and placement of characters to be typeset;

(b) font storage means for storing and providing second digital data defining the contour of each character of at least one font with respect to a normalized encoding set of first and second coordinates;

(c) electronic data processing means, connected to said input means and said font storage means, for receiving said first and second digital data and producing third digital data defining the boundaries of a plurality of characters, specified by said first digital data, at the points of intersection with a raster line, and,

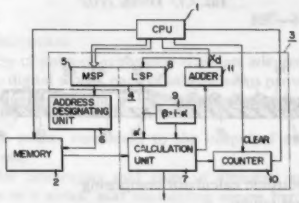
(d) character imaging means, connected to said electronic data processing means, receiving said third digital data for writing said characters on an imaging surface.

4,231,097

APPARATUS FOR CALCULATING A PLURALITY OF INTERPOLATION VALUES

Shigeki Shibayama; Kazuhide Iwata, and Nobuo Okuda, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 7, 1978, Ser. No. 967,420
Claims priority, application Japan, Dec. 12, 1977, 52/148171
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—577 **4 Claims**



4. A tomographic apparatus for displaying an image of a subject scanned by radiation by generating a plurality of interpolation values I_J–I_1, I_2, . . . I_n from a plurality of data values D_J–D_1, D_2 . . . D_n in a data train, said tomographic apparatus comprising:

means for generating radiation beams in a predetermined

pattern such that radiation beam scans of said subject can be effected in different directions;

means for detecting the direction and intensity of radiation beams penetrating said subject;

means for converting to projection data parallel components of said detected radiation beams;

memory means for storing said projection data as said data values D_j in sequential memory storage positions;

means for calculating said interpolation values I_j from said data values D_j to reconstruct an image corresponding to a distribution of absorption factor data of said radiation beams in cross-sectional areas of said subject, said calculating means comprising (1) an N-bit register having an upper M-bit portion for addressing said data values D_j stored in said memory means, and a lower (N-M) bit portion for generating weighting coefficient data to obtain an interpolation value I_j from two sequential data values D_j, D_{j+1} stored in said memory means, and (2) a calculator unit for computing an interpolation value I_j from said addressed two sequential data values D_j, D_{j+1} and said weighting coefficient data;

a counter incremented by a fixed value each time an interpolation value is computed by said calculating unit, said counter for generating an end signal after a predetermined number of interpolation values have been computed;

an adder for incrementing said lower portion of said N-bit register by an amount equal to a sampling interval for said interpolated data each time an interpolation value is computed;

a central processing unit coupled to said memory means, said N-bit register, said adder, and said counter for (1) controlling the storing of said projection data in said memory means, (2) supplying the initial address of a said projection data D_j in said memory means to said higher bit portion of said N-bit register, (3) supplying the initial weighting coefficient data to said lower bit portion of said N-bit register, and (4) clearing said counter in response to said end signal;

image memory means for storing said computed interpolation values;

means for converting said interpolation values stored in said image memory means to corresponding analog values; and

means controlled by said analog values for displaying an image of said subject scanned by said radiation beams.

4,231,098

CASING OF ELECTRONIC CALCULATORS

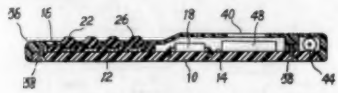
Akira Tanimoto, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 611,678, Sep. 9, 1975, abandoned. This application Aug. 3, 1978, Ser. No. 930,679

Claims priority, application Japan, Sep. 9, 1974, 49-104254; Dec. 30, 1974, 50-1630; Apr. 23, 1975, 50-56086[U]

Int. Cl.[2] H05K *7/02*

U.S. Cl. 364—708 **17 Claims**



1. An electronic calculator comprising:

a. an upper cover;

b. wiring patterns directly formed on an inner surface of the upper cover;

c. a display unit mounted on the inner surface of the upper cover and electrically connected to the wiring patterns;

d. a computation circuit unit mounted on the inner surface of the upper cover and electrically connected to the wiring patterns;

e. key contact patterns formed directly on the inner surface of the upper cover and electrically connected to the wiring patterns;

f. key switches electrically associated with the key contact patterns; and

g. a bottom and side cover fixed to the upper cover.

4,231,099

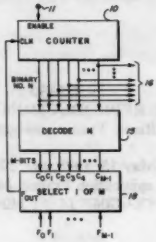
DIGITAL FUNCTION GENERATOR

Juris Stauers, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1979, Ser. No. 62,096

Int. Cl.[3] G06F *1/02*

U.S. Cl. 364—718 **6 Claims**



1. A digital function generator comprising:

(a) a counter having an input for receiving pulses to be counted and a plurality of outputs;

(b) switching means having a plurality of pulse inputs connected to receive pulses thereon with the pulses having a different repetition rate on each of the different inputs, an output, and a plurality of selection inputs for coupling a selected pulse input to the output in response to a signal applied to a specific selection input, the output being further connected to the input of said counter; and

(c) decode means having a plurality of inputs connected to the plurality of outputs of said counter and a plurality of outputs connected to the plurality of selection inputs of said switching means for providing signals on the selection inputs in a predetermined sequence and at the occurrence of predetermined counts in said counter.

4,231,100

ARRANGEMENT FOR FILTERING COMPRESSED PULSE-CODE-MODULATED SIGNALS

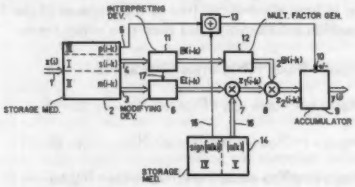
Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,605

Claims priority, application Netherlands, Jan. 13, 1978, 7800406

Int. Cl.[3] G06F *15/31*

U.S. Cl. 364—724 **3 Claims**



1. A digital filter arrangement for filtering non-uniformly quantised pulse code-modulated signals formed by a sequence of code groups x(i) each comprising a segment number s(i) and a mantissa number m(i), which digital filter arrangement comprises:

a first storage medium comprising first storage locations for storing the segment numbers s(i−k), second storage locations for storing the mantissa numbers m(i−k) of a given plurality of N consecutive code groups x(i−k), where k=0, 1, 2, . . . N−1 and i= . . . −3, −2, 0, 1, 2, 3, . . . , and outputs for sequentially supplying the stored code groups;

a second storage medium for storing the absolute magnitudes |a(k)| of N filter coefficients a(k) and having outputs for sequentially supplying the stored absolute magnitudes; means coupled to the second storage location of said first storage medium for modifying the mantissa numbers m(i−k) and for generating modified mantissa numbers E(i−k);

first multiplying means connected to the modifying means and coupled to the second storage medium for generating first product numbers $z_1(i-k)=E(i-k)|a(k)|$;

second multiplying means connected to the first multiplying means;

means for coupling the second multiplying means to the output of the first storage locations of said first storage medium; and

accumulating means coupled to the second multiplying means for accumulating the product formed in said second multiplying means.

4,231,101
DIGITAL FILTER ARRANGEMENT FOR NON-UNIFORMLY QUANTIZED PCM

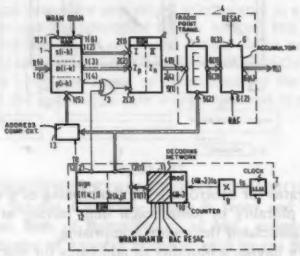
Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,805

Claims priority, application Netherlands, Feb. 20, 1978, 7801866

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—724 **6 Claims**



1. Digital filter arrangement for filtering non-uniformly quantised pulse code-modulated signals formed by a sequence of code groups x(i), each comprising a polarity bit p(i), a segment number s(i) and a mantissa number m(i), wherein this arrangement comprises:

means for cyclically generating a series of consecutively occurring predetermined auxiliary code words each of which is formed by a second polarity bit and an address code, said means comprising a second polarity bit output and an address code output;

a first storage medium having addressable storage locations and being arranged for storing N consecutively occurring code groups x(i−k) where in k=0, 1, 2, . . . N−1 and i=. . . −3, −2, −1, 0, 1, 2, 3, . . . , which first storage medium comprises a storage location address input, an input for receiving said code groups x(i−k), a segment number output, a mantissa number output and a polarity bit output;

means for coupling the address code output of the generating means to the storage location address input of the first storage medium;

a second storage medium having a first and a second storage field, each addressable by means of a storage field address code, each storage field comprising storage locations which are addressable by means of storage location address codes, the second storage medium comprising storage location address inputs, a storage field address input and an output;

means for coupling the segment number and mantissa number outputs of the first storage medium to the respective storage location address inputs of the second storage medium;

exclusive OR-gate means comprising inputs connected to the polarity bit output of the generating means and the first storage medium, respectively, and comprising an output connected to the storage field address input of the second storage medium;

accumulating means, operating in 1- or 2-complement, comprising an input coupled to the output of the second storage medium and means for shifting, relative to one another, the number supplied by the second storage medium and the accumulating means content, the shifting means being controlled by shift commands applied to the accumulating means through a shift command input; and

means for coupling the shift command input to the address code output of the generating means.

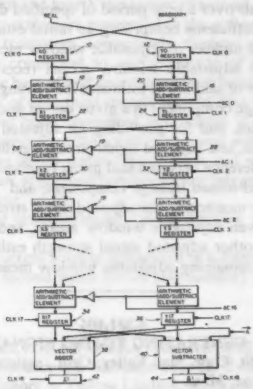
4,231,102
CORDIC FFT PROCESSOR

Paul C. Barr, Framingham, and Herbert L. Groginsky, Wellesley, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 21, 1978, Ser. No. 972,123

Int. Cl.³ G06F *15/332*

U.S. Cl. 364—726 **9 Claims**



1. In combination:

a plurality of pairs of arithmetic elements adapted for input of two digital words, each of said elements providing as an output either a sum or difference of two input digital words;

a storage means connected to the output of each of said elements;

means for connecting said pairs of elements and storage means in a series, said connecting means hardwire connecting bits of the contents of storage means to inputs of both of the elements of the next sequential pair of elements in said series; and

said connecting means comprising means for bit transpositioning where necessary such that if the contents of two said storage means of a pair of elements are X_i and Y_i where i is the number of the arithmetic element pair in said series, the outputs of the next sequential pair of arithmetic

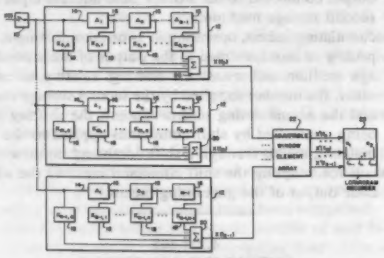
elements in said series will be $X_i \pm 2^{-n} Y_i$ and $Y_i \pm 2^{-n} X_i$, respectively.

4,231,103

FAST FOURIER TRANSFORM SPECTRAL ANALYSIS SYSTEM EMPLOYING ADAPTIVE WINDOW

John E. Timm, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1979, Ser. No. 11,339
Int. Cl.³ G06F *15/332*
U.S. Cl. 364—726 **16 Claims**



1. Spectral analysis apparatus comprising:

a Fast Fourier Transform processor receiving a time domain signal for providing the frequency domain coefficients of the Fast Fourier Transform of said time domain signal which is generated when said processor is operated to sample said time domain signal at a specified number of intervals over a time period of specified duration, each of said coefficients comprising an initial estimate;

a selected number of adjustable window means, a given one of said adjustable window means receiving a selected number of said initial estimates for sensing the presence of a leakage component in a given one of said received initial estimates, and for providing an adjusted signal strength estimate, said adjusted signal strength estimate comprising the difference between said given received initial estimate and said sensed leakage component; and

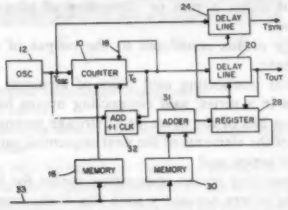
means for monitoring the adjusted signal strength estimate of said given adjustable window means, and also for monitoring other adjusted signal strength estimates provided by the remaining adjustable window means.

4,231,104

GENERATING TIMING SIGNALS

Richard P. St. Clair, Simi Valley, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Apr. 26, 1978, Ser. No. 900,189
Int. Cl.³ G06F *1/04*; G06M *3/02*
U.S. Cl. 364—900 **14 Claims**



1. A signal generator, comprising

a clock for generating clock signals separated in time by a clock period,

programmable counting means for counting said clock signals and providing outputs at predetermined counts,

said outputs being separated in time by an integer multiple of said clock period,

delay means for providing a timing signal after a delay interval following each said output,

the resolution of said delay means being greater than that of said clock, and

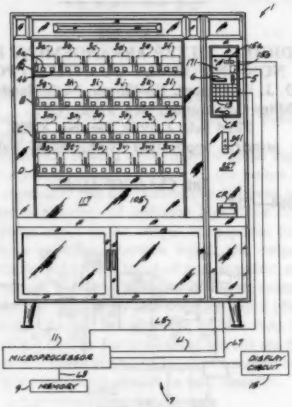
programmable delay means for repeatedly changing said delay interval for successive said timing signals so that said timing signals are separated in time by other than integer multiples of the period of said clock.

4,231,105

VENDOR CONTROL CIRCUIT

James T. Schuller, St. Louis County; Paul N. Albrecht, Ballwin, and Hugo M. Canizares, Bridgeton, all of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Jul. 5, 1978, Ser. No. 921,960
Int. Cl.³ G07F *11/62*; G06F *15/21*
U.S. Cl. 364—900 **38 Claims**



1. Apparatus for controlling the functioning of a vendor for vending a plurality of items, each item having at least one parameter associated therewith, comprising:

a memory having a plurality of addresses for storing values of at least some of the parameters in predetermined memory addresses, the parameter values stored in the predetermined memory addresses being electrically alterable;

processing means responsive to a plurality of vendor status inputs, a plurality of inputs from the memory, and a plurality of control inputs, for performing arithmetic and logic operations with those inputs and with the values of the parameters associated with the items in a sequence controlled by a preselected set of instructions which constitute a program and for supplying output signals based upon results obtained from said operations to control functioning of the vendor, the predetermined memory addresses being accessible by the processing means and the parameter values stored therein being alterable by said processing means;

interrogation means operable by authorized personnel for retrieving from memory the values of at least some of the parameters stored therein; and

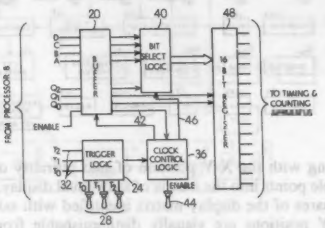
display means for visually displaying a parameter value retrieved from memory by the interrogation means independently of any other input of said processing means being equal in value to the value of the parameter retrieved from the memory, whereby authorized personnel

may utilize the interrogation means to retrieve the value of a desired parameter from the memory.

4,231,106
PERFORMANCE MONITOR APPARATUS AND METHOD

David L. Heap, Centerville, and Allen L. Kenner, Magna, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,242
Int. Cl.[3] G06F *9/00*
U.S. Cl. 364—900 14 Claims



1. Performance monitor apparatus for receiving instruction data words and for developing various output signals in response thereto, said instruction data words including address bits and operation bits, said apparatus including

buffer means for receiving and temporarily registering an instruction data word,

register means comprising a plurality of bistable elements, each for producing either a first or second output signal in response to receipt of a first or second operation signal respectively and receipt of a select signal,

select logic means for applying a select signal to a particular bistable element identified by the address bits of the instruction data word registered in said buffer means, and

means for supplying to said bistable elements either a first or second operation signal as determined by the operation bits of the instruction data word registered in said buffer means.

4,231,107
SERRIFORM STRIP CROSSTIE MEMORY

Leonard J. Schwee, Colesville; Henry R. Irons, and Wallace E. Anderson, both of Beltsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1978, Ser. No. 877,633
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—87 77 Claims

1. In a logic system, a serially accessible crosstie memory element, comprising:

a ferromagnetic oblong layer having, denticulated margins parallel to and symmetric about the oblong centerline of the layer; and,

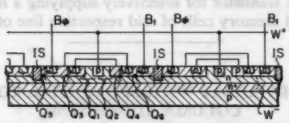
electrical means external to, electrically insulated from, and running along the centerline of said ferromagnetic layer for creating a field pattern on said ferromagnetic layer;

whereby along said centerline a domain wall may be positioned, and along said domain wall crossties may be nucleated at and Bloch lines may be nucleated between, opposite narrow cross-sections of said margins, and Bloch lines may be propelled.

4,231,108
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Masao Suzuki, Kodaira; Toshio Hayashi, Tokorozawa; Kuniyasu Kawarada, Musashino; Kazuhiro Toyoda, Yokohama, and Chikai Ono, Kawasaki, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Fujitsu Limited, both of Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 48,256
Claims priority, application Japan, Jun. 14, 1978, 53-71666
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—174 9 Claims



1. A semiconductor integrated circuit device having an array of integrated injection logic memory cells, each said integrated injection logic memory cell comprising a pair of first and second transistors of first conduction type with common emitters forming an injector connected to a first word line, a pair of third and fourth transistors of second conduction type having their collectors connected to the collectors of said first and second transistors, respectively, the base of said third transistor being connected to said collector of said fourth transistor and the base of said fourth transistor being connected to said collector of said third transistor, said first and second transistors having bases connected in common to emitters of said third and fourth transistors and to a second word line, said second word line thusly connecting to each said memory cell of said at least one array, said semiconductor integrated circuit device comprising

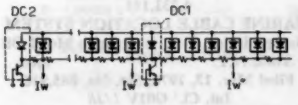
a bulk of said semiconductor device forming said second word line,

at least two current sources connected in a distributed fashion to said second word line of said memory cell array.

4,231,109
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Chikai Ono, Kawasaki, and Kazuhiro Toyoda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 29, 1979, Ser. No. 53,274
Claims priority, application Japan, Jun. 30, 1978, 53-79391; Dec. 29, 1978, 53-165131
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—174 12 Claims



1. A semiconductor integrated circuit device having an array of integrated injection logic memory cells, each said memory cell comprising first and second transistors having common emitters of a first conduction type and comprising an injector of the cell, third and fourth transistors having emitters

of a second conduction type opposite to said first conduction type with their collectors respectively connected to the collectors of said first and second transistors, said third transistor having its base connected to the collector of said fourth transistor and said fourth transistor having its base connected to the collector of said third transistor, said first and second transistors having bases connected in common and to the emitters of said third and fourth transistors, and first and second word lines along respective lines of said array, each said first word line being connected to said injectors of the cells of the respective line of the array and each said second word line being similarly connected to the bases of said first and second transistors, said semiconductor integrated circuit device comprising

each said second word line comprising a semiconductor bulk portion,

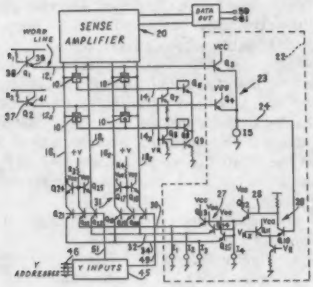
dummy cells distributed in each said line of said memory cell array, each of said dummy cells comprising a shunt circuit for shunting a respective portion of a write current supplied to selected ones of said integrated injection logic memory cells of the respective line of cells, each of said shunt circuits comprising an injector, and a hold current supply transistor for selectively supplying a hold current to said memory cells of said respective line of cells.

4,231,110

MEMORY ARRAY WITH SEQUENTIAL ROW AND COLUMN ADDRESSING

Jonathan J. Stinehelfer, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Jan. 29, 1979, Ser. No. 7,103
Int. Cl.³ G11C *8/00, 7/00*
U.S. Cl. 365—194 **8 Claims**



4. An electronic static memory having a plurality of static memory cells arranged in an array of rows and columns wherein each cell exists in a selected logic state of at least two stable logic states, means for selectively addressing each row, means for selectively addressing each column, and means for sensing the logic states of the cells, characterized in that the memory includes means for delaying addressing of a column until after an addressed row has achieved a voltage level suitable for the sensing means to sense.

4,231,111

MARINE CABLE LOCATION SYSTEM

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,916
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—19 **6 Claims**

1. A system for visually displaying the position of a cable towed by a marine vessel, comprising:

(a) means for providing navigational information signals indentifying the X-Y coordinate of said marine vessel,

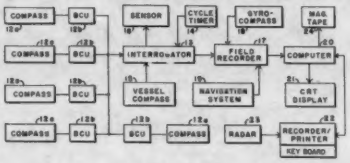
(b) a sensor located on said marine vessel for providing a signal representative of the heading of said marine vessel as it tows said cable through the water,

(c) a plurality of sensors located at select points along said cable for providing signals representative of the heading of tangents to the cable at said select points,

(d) means responsive to the signals from said cable sensors, from said marine vessel sensor, and from said navigational information means for determining the X-Y coordinate of each of said plurality of cable sensors,

(e) a visual display having a matrix of display squares,

(f) means for entering the X-Y position of said marine vessel



along with the X-Y position of said plurality of selected cable points into the matrix of said visual display, whereby squares of the display matrix identified with said entered X-Y positions are visually distinguishable from the remaining squares to display a locus of points defining the configuration of the towed cable,

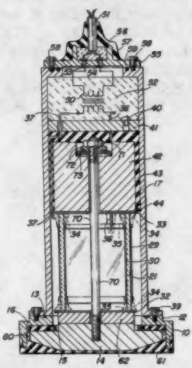
(g) means for identifying the X-Y coordinates of obstacles in the path of said cable as it is being towed by said marine vessel, and (h) means for entering the X-Y coordinates of said obstacles into the matrix of said visual display to visually display a mark representing the position of the obstacle relative to the cable.

4,231,112

HIGH-POWER UNDERWATER TRANSDUCER WITH IMPROVED PERFORMANCE AND RELIABILITY CHARACTERISTICS AND METHOD FOR CONTROLLING SAID IMPROVED CHARACTERISTICS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass.

Filed Jul. 30, 1970, Ser. No. 59,656
Int. Cl.² G01V *1/00*; H04B *13/00*
U.S. Cl. 367—158 **11 Claims**



8. A method of adjusting the resonant frequency of an electroacoustic transducer including a polarized ceramic tube mechanically coupled between a vibratile piston and an inertial mass element to simultaneously transmit oscillatory forces to both said piston and said element, said method including the steps of: (1) measuring the mechanical compliance of said ceramic tube; (2) selecting a weight having a magnitude which

corresponds to the magnitude of the compliance of the particular ceramic tube; and (3) attaching said selected weight to said piston in combination with said measured ceramic tube.

4,231,113

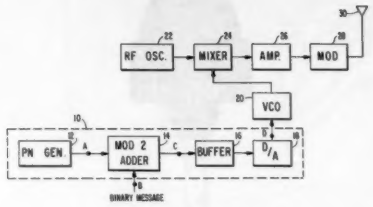
ANTI-JAM COMMUNICATIONS SYSTEM

Herman L. Blasbalg, Baltimore, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 378,302, Jun. 26, 1964. This application Mar. 11, 1968, Ser. No. 713,564

Int. Cl.³ H04K *1/02*; H04L *9/02*

U.S. Cl. 455—29 **21 Claims**



18. A method for transmitting binary data in the form of transmitted electrical signals comprising the steps of:

generating a pseudo-random binary sequence composed of bits each bit 1/N the length of a binary message bit where N is greater than one;

modulating said pseudo-random sequence with binary message bits; and

successively controlling at least one parameter of the transmitted signals in response to the analog values of successive portions of said modulated pseudo-random sequence.

4,231,114

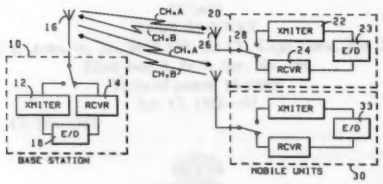
SYNCHRONIZING MEANS FOR A TWO-WAY COMMUNICATION SYSTEM

Arman V. Dolikian, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1978, Ser. No. 881,307

Int. Cl.³ H04B *1/50*

U.S. Cl. 455—49 **5 Claims**



1. In a two-way communication system comprised of a base station and a plurality of mobile stations wherein the base station transmits to all mobiles over a first channel and the mobile stations transmit to the base station over a second channel and wherein the information carried by each transmission is encoded using a predetermined transmit clock signal, with proper decoding of each transmission requiring phase synchronization to said transmit clock signal, the improvement in a mobile station comprising:

a master oscillator for producing a signal of frequency kf_o at an output where k is a predetermined integer;

detector means for preparing said base station transmissions for decoding, and coupling a prepared signal to an output;

a clock recovery means, being coupled to the outputs from the master oscillator and the detector means, for producing a receiver clock signal which is phase locked to said prepared signal; and

means for utilizing the clock recovery means receiver clock signal as the transmit clock time base for an encoded transmission by said mobile station such that the transmission by said mobile station over said second channel is substantially synchronized to the base station transmission over the first channel.

4,231,115

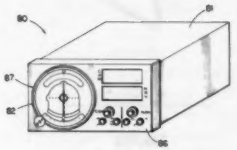
MODULAR RADIO

Claude L. Henderson, Camby, and Edmund L. Abner, Indianapolis, both of Ind., assignors to General Aviation Electronics, Inc., Indianapolis, Ind.

Division of Ser. No. 870,678, Jan. 19, 1978, Pat. No. 4,134,070, which is a continuation-in-part of Ser. No. 784,161, Apr. 4, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 963,700

Int. Cl.³ H04B *1/38*

U.S. Cl. 455—73 **6 Claims**



1. A combination NAV/COM aviation radio and VOR indicator comprising:

a main body receiver portion;

a VOR indicator electrically connected within said main body receiver portion and removable therefrom;

means for selectively mounting said VOR indicator in a first orientation within said main body receiver portion and in a second orientation separately from said main body receiver portion; and

cable means electrically connecting said main body receiver portion with said VOR indicator.

4,231,116

RADIO STATION SYSTEM

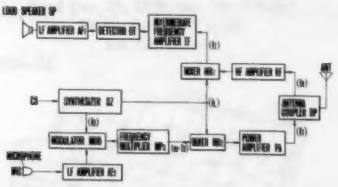
Nobuo Sekiguchi, Kodaira; Yukinari Fujiwara, Musashimurayama; Mitsuo Toya, Fujisawa, and Yoichi Kaneko, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,431

Claims priority, application Japan, Mar. 27, 1978, 53-35122

Int. Cl.³ H04B *1/50*

U.S. Cl. 455—87 **3 Claims**



1. In a radio station system for transmission and reception of signals from a modulation signal source utilizing multichannel transmission and reception frequencies of the type comprising a transmitter and receiver wherein a multi-frequency signal source is supplied with a channel designation input to produce

the local reference frequency signal for the receiver and the transmission frequency signal for the transmitter and wherein the difference between the transmission and reception frequencies is made equal to the intermediate frequency with respect to respective channels, the improvement which comprises means for directly utilizing a variable frequency output of said multifrequency signal source and said local reference frequency signal, said variable output being responsive to said channel designation input to select channel frequencies, means for producing a fixed frequency output from said multi-frequency signal source, means responsive to said fixed frequency and said modulation signal for producing a modulated carrier wave having a frequency twice said intermediate frequency, means for shifting the frequency of said variable output by the frequency of said carrier wave, and means for utilizing said freuqency shifted output to determine said transmission frequency.

DESIGNS

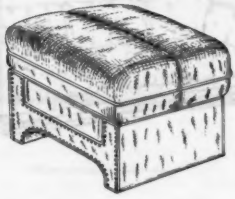
OCTOBER 28, 1980

257,448
BABY BONNET
Paul E. Johnson, Jr., 5921 SW. 1st Ct., Cape Coral, Fla. 33904
Filed Jan. 3, 1979, Ser. No. 767
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—243

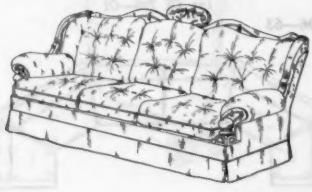
257,449
BABY BONNET
Paul E. Johnson, Jr., 5921 SW. 1st Ct., Cape Coral, Fla. 33904
Filed Jan. 3, 1979, Ser. No. 768
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—243

257,450
CHAIR
John R. Radek, Hinsdale, Ill., assignor to Ready Metal Mfg. Co., Chicago, Ill.
Filed May 19, 1978, Ser. No. 907,886
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7

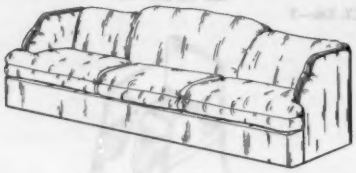
257,451
OTTOMAN
Randy R. Culler, High Point, N.C., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed Jan. 2, 1979, Ser. No. 652
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



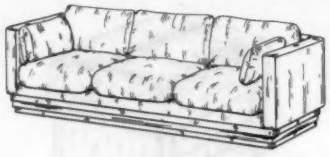
257,452
SEAT OR SIMILAR ARTICLE
David P. G. Williams, Englewood, N.J., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Dec. 29, 1978, Ser. No. 974,321
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



257,453
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Dec. 20, 1978, Ser. No. 971,529
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

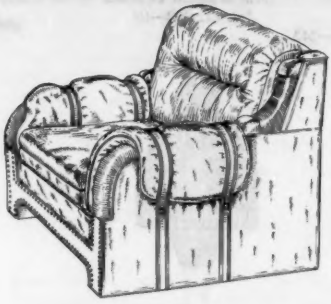


257,454
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Dec. 20, 1978, Ser. No. 971,530
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

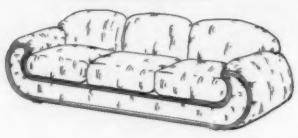


257,455
SOFA
Richard Brooks, North Hollywood, Calif., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Dec. 20, 1978, Ser. No. 971,531
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

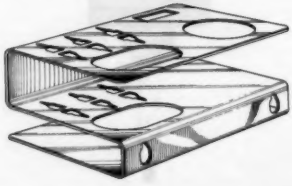
257,456
SEAT
Randy R. Culler, High Point, N.C., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed Jan. 2, 1979, Ser. No. 653
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



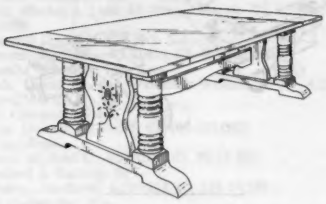
257,457
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Jan. 8, 1979, Ser. No. 1,967
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



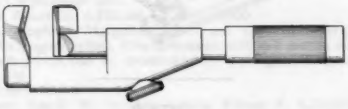
257,458
CADDY FOR DENTAL CARE IMPLEMENTS
Lucien E. Benoit, R.F.D. #1, Ridge Hill Rd., Woonsocket, R.I. 02895
Filed Nov. 27, 1978, Ser. No. 965,250
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—91



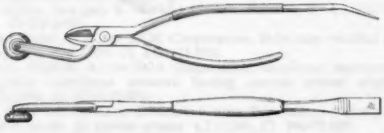
257,459
DINING ROOM TABLE
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed Oct. 30, 1978, Ser. No. 956,214
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



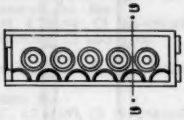
257,460
DEVICE TO REFORM THREADS
Henry A. Laub, Jr., 1736 N. Allen, Pasadena, Calif. 91104, and Steven D. Laub, 9340 E. Olive St., Temple City, Calif. 91780
Filed Jan. 30, 1978, Ser. No. 873,399
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—51



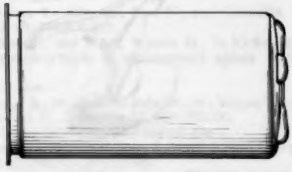
257,461
COMBINATION TOOL FOR GLAZING
Danny L. King, 618 S. Driftwood Dr., Santa Ana, Calif. 92704
Filed Dec. 4, 1978, Ser. No. 966,066
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—55



257,462
COMBINED CONTAINER FOR CANDY OR THE LIKE AND TOY BUILDING BLOCK
Peter K. Bayly, Eltham North, Australia, assignor to Nicholas Proprietary Limited
Continuation-in-part of Ser. No. 788,899, Apr. 19, 1977, Pat. No. Des. 252,978. This application Apr. 27, 1978, Ser. No. 901,022
Claims priority, application Australia, Apr. 11, 1977, 73249/77
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

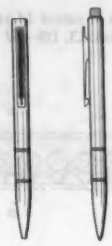


257,463
BEVERAGE CONTAINER
Arlin L. Campbell, and Roger B. Cannon, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.
Filed Aug. 17, 1977, Ser. No. 825,466
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



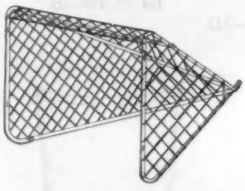
257,464
BIN FOR GRANULAR MATERIAL
John D. Persiani, 633 Cree Ct., San Jose, Calif. 95123
Filed Nov. 16, 1978, Ser. No. 961,117
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

257,465
WRITING INSTRUMENT
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 23, 1979, Ser. No. 14,378
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

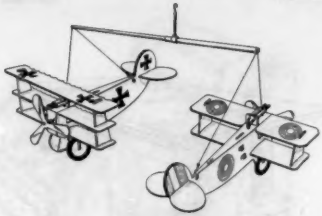


257,466
PAPERWEIGHT
Richard R. Smith, 600 Slaydon, Henderson, Tex. 75652
Filed Jan. 2, 1979, Ser. No. 563
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—97

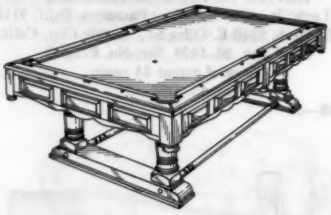
257,467
GAME GOAL
Edward L. Long, 5956 Atteentee Rd., Springfield, Va. 22150
Filed Aug. 15, 1978, Ser. No. 933,975
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—200



257,468
SIMULATIVE TOY MOBILE
Robert R. Schoch, 517 Otteray Dr., High Point, N.C. 27260
Filed Jun. 26, 1978, Ser. No. 919,259
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—62



257,469
BILLIARD TABLE
William D. Moore, High Point, N.C., assignor to Brunswick Corporation, Skokie, Ill.
Filed Dec. 6, 1978, Ser. No. 966,960
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232



257,470
FISHING SINKER
Henry Ciecierski, 15602 Union Ave., Harvey, Ill. 60426, and James J. Nieckula, Star Rte. Box 6315, Solon Springs, Wis. 54873
Filed Mar. 21, 1979, Ser. No. 22,416
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Bosch, Mahlon L.; and McKelvy, Marvin D., 4,230,357, Cl. 294-19.00R.

A. Ehrenreich GmbH & Co. KG: *See*—
Scheerer, Wolfgang, 4,230,415, Cl. 403-122.000.

A. H. Robins Company, Inc.: *See*—
Walsh, David A.; and Welstead, William J., Jr., 4,230,718, Cl. 424-274.000.

A. Stucki Company: *See*—
Wiebe, Donald, 4,230,047, Cl. 105-197.00D.

A-T-O Inc.: *See*—
Becker, Michael L., 4,230,024, Cl. 92-13.100.

AB Akerlund & Rausing: *See*—
Jeppsson, Jan-Bertil, 4,230,923, Cl. 219-10.530.

Abbott Laboratories: *See*—
Decker, Richard H.; Ling, Chung-Mei; and Overby, Lacy R., 4,230,683, Cl. 424-1.000.
Rosenbrook, William, Jr., 4,230,848, Cl. 536-17.00R.
Tadanier, John S.; and Martin, Jerry R., 4,230,846, Cl. 536-4.000.

Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, to Nissan Motor Company, Limited. Low-noise-level internal combustion engine. 4,230,087, Cl. 123-193.0CH.

Abe, Norio: *See*—
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.

Abex Corporation: *See*—
Borruso, Joseph V., 4,231,081, Cl. 362-306.000.

Abner, Edmund L.: *See*—
Henderson, Claude L.; and Abner, Edmund L., 4,231,115, Cl. 455-73.000.

Abramovich, Dan: *See*—
Springett, Charles N.; Abramovich, Dan; Uyeda, Stanley T.; and Radu, E. John, 4,230,421, Cl. 405-168.000.

Ack-Ti-Lining, Inc.: *See*—
Alexander, Norman R.; and Sutton, Harold F., 4,229.834, Cl. 2-146.000.

Acro-Matic, Inc.: *See*—
Birrell, Peter L., 4,230,239, Cl. 222-185.000.

Acroform Corporation: *See*—
Fisher, Robert E., 4,230,446, Cl. 431-123.000.

Adelmann, Siegfried; Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Polycarbonates with end groups containing bonds which can be crosslinked by UV light. 4,230,548, Cl. 204-159.140.

Adkins, Robert J.: *See*—
Graeser, Joseph H., Jr.; and Adkins, Robert J., 4,231,041, Cl. 343-767.000.

Advanced Instrument Development, Inc.: *See*—
Wiegman, Douglas C.; and Grichnik, James A., 4,230,944, Cl. 250-355.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Le Corre, Maurice; Hercouet, Alain; and Begasse, Beatrice, 4,230,624, Cl. 260-345.200. .
Vedrine, Alain; Gacon, Jean-Claude; Boulon, Georges; and Trottier, Danielle, 4,230,598, Cl. 252-301.40H.

Agence Nationale de Valorisation de la Recherche-Anvar: *See*—
Pegourie, Jean-Pierre, 4,229,984, Cl. 74-125.500.

AGFA-Gevaert, A.G.: *See*—
Moller, Ursula, 4,230,407, Cl. 355-27.000.
Renner, Gunter; and Scheben, Quirin, 4,230,851, Cl. 544-183.000.
Wick, Richard; Stemme, Otto; Lermann, Peter; Wagner, Karl; Borowski, Kurt; Cocron, Istvan; and Fauth, Gunter, 4,230,400, Cl. 354-25.000.

AGFA-GEVAERT N.V.: *See*—
Vanden Eynde, Hector A.; and Van Poucke, Raphael K., 4,230,870, Cl. 548-360.000.

Agro Sciences, Inc.: *See*—
Steere, William C.; and Wilson, Stephen S., 4,230,983, Cl. 324-71.00R.

AHI Operations Limited: *See*—
Phillips, Dougald S. M.; and Phillips, Peter A. J., 4,229,972, Cl. 73-304.00R.

Ahmed, Adel A. A., to RCA Corporation. Television vertical ramp generator. 4,230,998, Cl. 331-111.000.

Ahmed, Adel A. A., to RCA Corporation. Oscillator incorporating negative impedance network having current mirror amplifier. 4,230,999, Cl. 331-115.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. Ink issuance orifice protection in an ink jet system printer. 4,231,046, Cl. 346-75.000.

Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, to Leybold-Heraeus GmbH. Method of evaporating melts of alloys of metals having different vapor pressures. 4,230,739, Cl. 427-42.000.

Air Industrie: *See*—
Rebours, Albert; and Guibet, Jean-Pierre, 4,230,468, Cl. 55-294.000.

Air Products and Chemicals, Inc.: *See*—
Bartish, Charles M., 4,230,641, Cl. 568-454.000.
Klee, David J., 4,229,947, Cl. 62-374.000.

Airco, Inc.: *See*—
Paradise, William L., Jr.; and Byars, Mark L., 4,230,732, Cl. 426-393.000.

Airfix Industries Limited: *See*—
Sutch, Brian L. C., 4,230,659, Cl. 264-266.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Goto, Hiromi; and Kagata, Tooru, 4,230,211, Cl. 192-35.000.
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,229,998, Cl. 74-865.000.

Akzona Incorporated: *See*—
Hansma, Hendrik; and Schroeder, Arnold, 4,230,889, Cl. 568-559.000.
Lustig, Klaus P.; and Kaper, Louris, 4,230,502, Cl. 106-314.000.
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,230,612, Cl. 260-33.20R.

Alamar Associates: *See*—
Weiss, Allen, 4,230,417, Cl. 403-301.000.

Albany International Corp.: *See*—
McConaughy, David F., 4,230,419, Cl. 405-66.000.

Alberts, Heinrich; and Balle, Gerhard, to Bayer Aktiengesellschaft. Polyurethane foams and elastomers based on modified polyether polyols. 4,230,823, Cl. 521-137.000.

Albrecht, Konrad: *See*—
Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, 4,230,809, Cl. 521-65.000.

Albrecht, Paul N.: *See*—
Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., 4,231,105, Cl. 364-900.000.

Albrecht, William L.; and Jones, Winton D., to Richardson-Merrell Inc. 1,2,4-Triazole-3-thiols as antisecretory agents. 4,230,715, Cl. 424-269.000.

Albright, Jay D.: *See*—
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,230,705, Cl. 424-250.000.

Alcan Research and Development Limited: *See*—
Archer, Anthony M.; Cambridge, Edward L.; and Hewgill, Douglas F., 4,230,540, Cl. 204-67.000.

Aldea, Jacques; Eltgen, Jean-Jacques; and Thiollier, Gabriel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. Particle feed arrangement for applying solid particles to the image carrier of a non-impact printer. 4,230,069, Cl. 118-653.000.

Aldington, Thomas. Railway car wheelset and rails therefore. 4,230,043, Cl. 104-1.00A.

Alexander, Norman R.; and Sutton, Harold F., to Ack-Ti-Lining, Inc. Neckwear construction. 4,229,834, Cl. 2-146.000.

Alexandrov, Adolf M.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B., 4,229,946, Cl. 62-341.000.

Alexeev, Gennady M.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B., 4,229,946, Cl. 62-341.000.

Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., to American Cyanamid Company. 6-Phenyl-1,2,4-triazolo[4,3-b]pyridazines and their uses in treating anxiety. 4,230,705, Cl. 424-250.000.

Allen, Jim E.; and Farris, Robert E., to Kaiser Aluminum & Chemical Corporation. Method of repairing a refractory structure. 4,230,652, Cl. 264-30.000.

Allergan Pharmaceuticals, Inc.: *See*—
Cooper, Charles A.; and Bergamini, Michael V. W., 4,230,724, Cl. 424-317.000.

Allied Chemical Corporation: *See*—
Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,230,656, Cl. 264-171.000.
Stephenson, Robert L., 4,230,342, Cl. 280-803.000.

Allied Industries, Inc.: *See*—
Avery, Hugh E., Jr.; and Paulson, Jerome I., 4,230,426, Cl. 406-191.000.

Aluminum Company of America: *See*—
Donatelli, Paul C.; and Main, Kenneth G., 4,230,975, Cl. 318-6.000.

Amann, Herbert; and Morlock, Gerhard, to Deutsche Gold -und Silber-Scheidearstalt vormals Roessler. Polyoxymethylene molding composition containing melamine formaldehyde polycondensate. 4,230,606, Cl. 260-6.000.

Amerace Corporation: *See—*
Kotski, Edward J., 4,230,389, Cl. 339-75.00M.

American Can Company: *See—*
Bowen, Mack D.; and Purdy, Kenneth R., 4,230,602, Cl. 252-421.000.

American Cyanamid Company: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,230,705, Cl. 424-250.000.
Raghu, Sivaraman, 4,230,860, Cl. 546-134.000.
Shepherd, Robert G., 4,230,628, Cl. 260-404.000.
Shepherd, Robert G., 4,230,878, Cl. 560-48.000.
Wissner, Allen; and Grudzinskas, Charles V., 4,230,879, Cl. 560-121.000.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,230,617, Cl. 260-112.50S.

AMF Incorporzted: *See—*
Kilty, Michael; and Pernigotti, Allan, 4,230,573, Cl. 210-767.000.

Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, to Allied Chemical Corporation. Transparent sheets and containers formed from polycarbonate-polyester blends and formation thereof. 4,230,656, Cl. 264-171.000.

Ammon, J. Preston; and Weaver, Harry R., to Elfab Corporation. Printed circuit board, electrical connector and method of assembly. 4,230,385, Cl. 339-17.00R.

AMP Incorporated: *See—*
Fornwalt, Robert G.; and Shatto, Walter C., Jr., 4,230,008, Cl. 83-456.000.

Amstad, John H., to Atlas Pacific Engineering Company. Apparatus for continuous produce surface treatment. 4,230,034, Cl. 99-587.000.

AMSTED Industries Incorporated: *See—*
Kaim, John W., 4,230,228, Cl. 213-62.00A.

Anatychuk, Lukyan I.: *See—*
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.

Anderson, Albert L., to Digital Equipment Corporation. Reader for data recorded on magnetic disks at plural densities. 4,231,071, Cl. 360-40.000.

Anderson, Jerrold L.: *See—*
Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., 4,230,514, Cl. 156-305.000.

Anderson, Wallace E.: *See—*
Schwee, Leonard J.; Irons, Henry R.; and Anderson, Wallace E., 4,231,107, Cl. 365-87.000.

Andersson, Jan A. R.: *See—*
Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., 4,230,040, Cl. 102-13.000.

Ando, Shimon: *See—*
Iwamoto, Taro; Ando, Shimon; Kurokawa, Koji; and Kusumoto, Sho, 4,230,067, Cl. 118-104.000.

Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,230,721, Cl. 424-285.000.

Andresen, Herman J. Actuating device. 4,229,993, Cl. 74-538.000.

Andrews, Glenn C., to Pfizer Inc. 2,5-Diketogluconic acid esters. 4,230,880, Cl. 560-174.000.

Angelosanto, Donald J., to Huck Manufacturing Company. Pull-type blind fastener construction. 4,230,017, Cl. 85-70.000.

Anhalt, John W., to International Telephone and Telegraph Corporation. Electrical contact. 4,230,384, Cl. 339-17.00R.

Anheuser-Busch, Incorporated: *See—*
Ehrenthal, Irving; Slapshak, Louis F.; and Rajpara, Jagdish, 4,230,802, Cl. 435-94.000.

Anichkov, Andrei D. Stereotaxic apparatus. 4,230,117, Cl. 128-303.00B.

Aniszewski, Bodo; and Ehmann, Willy. Hair curler. 4,230,133, Cl. 132-40.000.

Antibioticos, S.A.: *See—*
Palomo Coll, Antonio L.; and Diago Meseguer, Jose, 4,230,849, Cl. 544-28.000.

Antill, John E., to United Kingdom Atomic Energy Authority. Alloys of Fe, Cr, Si, Y and Al. 4,230,489, Cl. 75-124.000.

Anzai, Shiro: *See—*
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, 4,230,168, Cl. 152-310.000.

Aoki, Mutsuhiro: *See—*
Katayama, Shigeru; and Aoki, Mutsuhiro, 4,230,840, Cl. 526-77.000.

Aoki, Shigeta: *See—*
Makino, Shigeo; Sugimura, Norboru; and Aoki, Shigeta, 4,230,512, Cl. 152-209.00R.

Aoki, Takao; Kadowaki, Hidejiro; and Iwami, Naoki, to Canon Kabushiki Kaisha. Process and apparatus for electrophotography. 4,230,783, Cl. 430-42.000.

Aoki, Takao: *See—*
Yoshida, Kiyotaka; Hatanaka, Yoshio; Kudo, Kesayoshi; and Aoki, Takao, 4,230,735, Cl. 426-557.000.

Aono, Shunji: *See—*
Maruyama, Isamu; Aono, Shunji; and Katsube, Junki, 4,230,706, Cl. 424-251.000.

Aoyagi, Masao: *See—*
Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, 4,230,403, Cl. 354-286.000.

Aoyama, Tetsuo: *See—*
Saito, Masao; Aoyama, Tetsuo; Horie, Shigeru; and Takada, Kazuo, 4,230,636, Cl. 260-561.00R.

Appleton Papers Inc.: *See—*
Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., 4,230,514, Cl. 156-305.000.

Aquapro A.G.: *See—*
Nieuwenhuis, Mogens D.; and Van Bracht, Raymond, 4,230,969, Cl. 315-241.00S.

Aquascooter, Inc.: *See—*
Ghizzoni, Angiolino, 4,230,646, Cl. 261-35.000.

Arai, Hirotoshi: *See—*
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.

Arai, Tohru: *See—*
Komatsu, Noboru; Arai, Tohru; and Fujita, Hironori, 4,230,751, Cl. 427-443.100.

Aramayo, Rene S. Catheter attachment for blood sampling. 4,230,128, Cl. 128-763.000.

Arcamone, Federico: *See—*
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, 4,230,619, Cl. 260-239.00A.

Archer, Anthony M.; Cambridge, Edward L.; and Hewgill, Douglas F., to Alcan Research and Development Limited. Technique for automatic quenching of anode effects in aluminium reduction cells. 4,230,540, Cl. 204-67.000.

Arcouette, Pierre. Kayak. 4,229,850, Cl. 9-1.400.

Argade, Shyam D.: *See—*
Balko, Edward N.; and Argade, Shyam D., 4,230,673, Cl. 422-225.000.

Armour-Dial, Inc.: *See—*
Izzo, Henry J.; Moran, Martin J.; and Wheeler, Frederick G., 4,230,693, Cl. 424-156.000.

Armstrong Cork Company: *See—*
Connolly, Arlene D.; Eshleman, James M.; and Knaub, Edgar W., 4,230,605, Cl. 252-545.000.
Corrigan, James L., 4,229,913, Cl. 52-38.000.
Kauffman, William J.; and Lilley, George L., 4,230,759, Cl. 428-159.000.

Arnold, Charles R.; and Pennington, Donald A., to Boeing Commercial Airplane Company. Stop-off compound and method of making. 4,230,614, Cl. 260-33.6PQ.

Arntz, Richard J.: *See—*
Gee, James W.; and Arntz, Richard J., 4,230,350, Cl. 292-144.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; Moriguchi, Kisoo; and Mizutani, Shigeru, 4,230,831, Cl. 525-240.000.
Seko, Maomi; Miyake, Tetsuya; Takeuchi, Hiroshi; and Tanouchi, Masatoshi, 4,230,882, Cl. 562-416.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hidaka, Tsuneo; Inoue, Masahide; and Ebihara, Masatomi, 4,230,455, Cl. 433-202.000.
Tokutomi, Seijrro; Jyojiki, Masao; and Nakamura, Kazuo, 4,230,401, Cl. 354-25.000.

Asakawa, Kobun: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.

Asamoto, Tetsuhiro: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.

Asari, Akira; Ueda, Masakazu; and Nishimoto, Takeo, to Kobe Steel, Limited. Indirect extrusion process. 4,230,661, Cl. 264-323.000.

Astra-Sjuco AB: *See—*
Ekbladh, Fred V. G., 4,230,102, Cl. 128-79.000.

Atkins, Herbert A., to Beecham Group Limited. Bottle with closure cap. 4,230,232, Cl. 215-330.000.

Atlantic Richfield Company: *See—*
Shawl, Edward T.; and Bullano, Gerald A., 4,230,877, Cl. 560-25.000.

Atlas Pacific Engineering Company: *See—*
Amstad, John H., 4,230,034, Cl. 99-587.000.

ATO Chimie: *See—*
Foy, Paul; Jungblut, Camille; and Deleens, Gerard, 4,230,838, Cl. 525-408.000.

Aucktor, Erich; and Rubin, Wolfgang, to Lohr & Bromkamp GmbH. Homokinetic universal joint. 4,229,952, Cl. 64-21.000.

Aude, Thomas C., to Bechtel International Corporation. Apparatus and method for slack flow elimination in a slurry pipeline. 4,230,137, Cl. 137-8.000.

Audi NSU Auto Union AG: *See—*
Ruda, Gunter, 4,230,366, Cl. 297-487.000.

Auer, Robert E.: *See—*
Pedroso, Raul I.; and Auer, Robert E., 4,230,031, Cl. 98-115.0LH.

Aufman, Joseph A.: *See—*
Falcione, Ronald J.; McManis, Ronald R.; and Aufman, Joseph A., 4,230,610, Cl. 260-29.60M.

August, Peter: *See—*
Maschberger, Adolph; and August, Peter, 4,230,820, Cl. 521-77.000.

Aurousseau, Andre; and Roger, Michel, to Svenska Aktiebolaget Bromsregulator. Governing device for a spring brake actuator. 4,230,021, Cl. 91-461.000.
Austin, George K., Jr. Multiple dental handpiece control system. 4,230,452, Cl. 433-28.000.
Austin, John J., to Champion International Corporation. Lunch box carton and a blank for forming same. 4,230,261, Cl. 229-52.00B.
Austin, Ronald: *See*—
Nasiatka, John R.; Austin, Ronald; and Schaudek, Ernest F., 4,230,249, Cl. 227-123.000.
Autodynamics, Inc.: *See*—
Newton, Robert P., 4,229,977, Cl. 73-487.000.
Automotive Products Limited: *See*—
Higgerson, Raymond; and Parsons, David, 4,229,940, Cl. 60-562.000.
Avery, Hugh E., Jr.; and Paulson, Jerome I., to Allied Industries, Inc. Method for treating conduit to improve flow characteristic and resulting conduit product. 4,230,426, Cl. 406-191.000.
Avrea, Walter C.; and Hansen, Robert N. Ball component for coupling apparatus. 4,230,336, Cl. 280-507.000.
Ayaha, Kyuhei, to Shikoku Kakooki Co., Ltd. Bottle aligning machine. 4,230,217, Cl. 198-397.000.
Ayerst McKenna & Harrison, Inc.: *See*—
Sehgal, Surendra N.; and Vezina, Claude, 4,230,692, Cl. 424-122.000.
Azevedo, Albert J. Backhoe finishing tool. 4,230,435, Cl. 414-722.000.
Azzis, Daniel; and Delaporte, Francois X., to International Business Machines Corporation. Digital to analog converter having separate bit converters. 4,231,020, Cl. 340-347.0DA.
B. F. Goodrich Company, The: *See*—
Enright, John J.; and Holzworth, William T., 4,230,253, Cl. 228-152.000.
B. H. Bunn Company: *See*—
Pierce, Paul, Jr.; and Beedy, Robert G., 4,230,035, Cl. 100-2.000.
B.S.R. Limited of Monarch Works: *See*—
Wearing, Brian J.; and Zaidi, Syed M. A., 4,230,921, Cl. 200-153.00J.
B. V. Neratoom: *See*—
Braat, Antonius M. M.; and Lagerwerf, Harry, 4,230,178, Cl. 165-76.000.
Babcock & Wilcox Company, The: *See*—
Johnston, Jesse C., Jr., 4,229,854, Cl. 15-316.00R.
Bach Laboratories, Inc.: *See*—
Bommersbach, Wolfgang; and Dean, Robert A., Jr., 4,230,012, Cl. 84-1.010.
Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,230,861, Cl. 546-164.000.
Badders, Edwin T. Fluid control valve. 4,230,145, Cl. 137-410.000.
Badger Company, Inc., The: *See*—
Sheely, Harold R.; Oricchio, F. Frederick; and Ferrari, Domenic C., 4,230,668, Cl. 422-140.000.
Bafaro, Michael P., to Motorola, Inc. Dynamic focus circuitry for a CRT data display terminal. 4,230,972, Cl. 315-382.000.
Bailey, John R. W.; Carter, Michael R. L.; and Fox, Richard, to ICI Australia Limited. Explosive fuze cord. 4,230,041, Cl. 102-27.00R.
Bailey, Thomas D., to Reilly Tar & Chemical Corp. Process for making 5-trifluoromethyl pyridone. 4,230,864, Cl. 546-303.000.
Bairon, Genrikh V.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B., 4,229,946, Cl. 62-341.000.
Baker, George H., Sr. Drapery pleating apparatus and method. 4,230,171, Cl. 160-84.00R.
Baker, Robert G.: *See*—
Culp, Richard E.; and Baker, Robert G., 4,230,578, Cl. 210-86.000.
Bakos, Peter, to International Business Machines Corporation. Decreasing the porosity and surface roughness of ceramic substrates. 4,230,773, Cl. 428-447.000.
Balducci, Luigi; and Rustioni, Massimo, to Montedison S.p.A. Inorganic pigments and method for preparing same. 4,230,500, Cl. 106-288.00B.
Balko, Edward N.; and Argade, Shyam D., to BASF Wyandotte Corporation. Apparatus for removing nitrogen trichloride from chlorine gas 4,230,673, Cl. 422-225.000.
Balle, Gerhard: *See*—
Alberts, Heinrich; and Balle, Gerhard, 4,230,823, Cl. 521-137.000.
Baltek Corporation: *See*—
Roberts, William M.; and Kohn, Jean, 4,230,061, Cl. 114-74.00A.
Baltz, Gene F., to Outboard Marine Corporation. Manual starter for internal combustion engines. 4,230,085, Cl. 123-185.00A.
Bamberger, Carlos E., to United States of America, Energy. Cyclic thermochemical process for producing hydrogen using cerium-titanium compounds. 4,230,682, Cl. 423-579.000.
Banzhaf, Werner: *See*—
Stumpp, Gerhard; and Banzhaf, Werner, 4,230,080, Cl. 123-568.000.
Baranaev, Mikhail I.: *See*—
Savinov, Evgeny A.; and Baranaev, Mikhail I., 4,229,963, Cl. 72-402.000.
Baranek, Bodo: *See*—
Lehmann, Wilfried; Muller, Hermann; and Baranek, Bodo, 4,230,438, Cl. 415-122.00R.
Barber-Colman Company: *See*—
Haug, Edward W., 4,230,428, Cl. 407-116.000.
Barden, Allan D. Support assembly for cooking utensils. 4,230,089, Cl. 126-30.000.
Bare, Thomas M., to ICI Americas Inc. Heterocyclic tetrahydro-1-alkyl-4-oxo-1H-imidazol-2-ylidene urea and phenyl esters of tetrahydro-1-alkyl-4-oxo-1H-imidazol-2-ylidene carbamic acid compounds. 4,230,713, Cl. 424-263.000.
Barger, Frank L.: *See*—
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,230,215, Cl. 196-46.000.
Barker, Robert I.; King, David P.; and Rice, Patrick F., to Monsanto Company. Method and apparatus for measuring the rheological properties of an extrudable material. 4,229,970, Cl. 73-56.000.
Barkov, Leonid A.: *See*—
Vydrin, Vladimir N.; Pastukhov, Valery V.; Barkov, Leonid A.; and Sysoev, Vladimir S., 4,229,961, Cl. 72-235.000.
Barkow, William H., to RCA Corporation. Deflection yoke with a magnet for reducing sensitivity of convergence to yoke position. 4,231,009, Cl. 335-212.000.
Barlow, Gordon A.; and Krutsch, John R., to Gordon Barlow Design. Skate board game. 4,230,314, Cl. 273-1.00E.
Barlow Marine Limited: *See*—
Porter, Raymond J., 4,230,306, Cl. 254-371.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich; and Dobbins, Donald J., 4,230,285, Cl. 242-43.00R.
Barnsbee, Clive D., to Eastman Kodak Company. Method for forming holes in thermoformed articles. 4,230,662, Cl. 264-553.000.
Barr, Paul C.; and Groginsky, Herbert L., to Raytheon Company. Cordic FFT processor. 4,231,102, Cl. 364-726.000.
Barreca Products Co., Inc.: *See*—
Finnegan, Robert J., 4,230,248, Cl. 224-323.000.
Bartish, Charles M., to Air Products and Chemicals, Inc. Hydroformylation of olefins. 4,230,641, Cl. 568-454.000.
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., to Bell Telephone Laboratories, Incorporated. Treating multilayer printed wiring boards. 4,230,553, Cl. 204-192.00E.
Bartman, Benjamin: *See*—
Swift, Graham; Bartman, Benjamin; and Cenci, Harry J., 4,230,772, Cl. 428-442.000.
Barton, Edwin A., to Vermont Log Building, Inc. Log-planing machine. 4,230,163, Cl. 144-116.000.
BASF Aktiengesellschaft: *See*—
Gall, Ludwig; and Fabian, Wolfgang, 4,230,858, Cl. 546-37.000.
BASF Wyandotte Corporation: *See*—
Balko, Edward N.; and Argade, Shyam D., 4,230,673, Cl. 422-225.000.
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., to Imperial Chemical Industries Limited. Control of pollen formation. 4,230,484, Cl. 71-111.0°0.
Batka, Robert J.: *See*—
Billington, Evans R.; Batka, Robert J.; and Korbilas, Christ P., 4,230,161, Cl. 141-302.000.
Battaglia, Luciano. Automatic center punch for templates. 4,230,011, Cl. 83-866.000.
Battelle Memorial Institute: *See*—
Guignard, Claude, 4,230,650, Cl. 264-24.000.
Battigelli, Jean A.: *See*—
Levecque, Marcel; and Battigelli, Jean A., 4,230,471, Cl. 65-2.000.
Baum, Burton M.: *See*—
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,230,591, Cl. 252-102.000.
Baum, Elliot I., to Quasar Microsystems, Inc. Telephone answering machine. 4,230,909, Cl. 179-6.00R.
Baumann-Schmid, Mary Margrith, heir: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Baxter, M. David: *See*—
Baxter, Stephen M.; Baxter, M. David; and Eadline, James D., 4,229,858, Cl. 17-44.000.
Baxter, Stephen M.; Baxter, M. David; and Eadline, James D. Boat-mountable fish-cleaning tray. 4,229,858, Cl. 17-44.000.
Baxter Travenol Laboratories, Inc.: *See*—
Zissimopoulos, Nick, 4,230,244, Cl. 222-450.000.
Bayer Aktiengesellschaft: *See*—
Adelmann, Siegfried; Margotte, Dieter; and Vernaleken, Hugo, 4,230,548, Cl. 204-159.140.
Alberts, Heinrich; and Balle, Gerhard, 4,230,823, Cl. 521-137.000.
Larbig, Wolfgang, 4,230,567, Cl. 210-600.000.
Oeckl, Siegfried; Scheinpflug, Hans; and Kraus, Peter, 4,230,723, Cl. 424-302.000.
Scholl, Hans-Joachim; and Zenner, Armin, 4,230,876, Cl. 560-25.000.
Tork, Leo; Kolb, Gunter; and Hohne, Wolfgang, 4,230,812, Cl. 526-320.000.
Zander, Jurgen, 4,230,637, Cl. 260-580.000.
Bays, Marvin G., to Texas Instruments Incorporated. Air release control in seismic energy source air gun. 4,230,201, Cl. 181-115.000.
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, to International Business Machines Corporation. Arrangement for micro instruction control. 4,231,085, Cl. 364-200.000.
BBC Brown, Boveri & Company, Limited: *See*—
Bernasconi, Felix R., 4,229,995, Cl. 74-625.000.

De Mesmaeker, Ivan, 4,230,982, Cl. 324-52.000.
Ruetsch, Christian; and Sittig, Roland, 4,231,054, Cl. 357-38.000.
BBP Kunststoffwerk Marbach Baier & Co.: *See*—
Wenzlick, Erich; and Rothfuss, Hermann, 4,230,382, Cl. 312-330.00R.
Beacco, Enzo; Bianchi, Maria L.; Minghetti, Annacleto; and Spalla, Celestino, to Societa Farmaceutici Italia S.p.A. Analogues of ergot alkaloids. 4,230,854, Cl. 544-346.000.
Beale, Allan A.: *See*—
LaVance, Cecil N.; and Beale, Allan A., 4,231,093, Cl. 364-460.000.
Beall, Nelson J.: *See*—
Brastad, William A.; and Beall, Nelson J., 4,230,924, Cl. 219-10.55E.
Beane, Russell R.: *See*—
Mann, Brian M.; and Beane, Russell R., 4,231,027, Cl. 340-636.000.
Beaussant, Raymond; and Claude, Jacques, to Intertechnique. Breathing and acceleration protection apparatus for aircraft crew members. 4,230,097, Cl. 128-1.00A.
Beazley, Rodney T., to Glacier Metal Company, Limited, The. Centrifugal separators. 4,230,581, Cl. 210-261.000.
Bechtel International Corporation: *See*—
Aude, Thomas C., 4,230,137, Cl. 137-8.000.
Chapman, Jay P., 4,230,153, Cl. 137-599.000.
Bechteler, Martin, to Siemens Aktiengesellschaft. Display device for illustrating variable and fixed information. 4,231,034, Cl. 340-765.000.
Beck, John P. Illuminated number display device. 4,229,894, Cl. 40-579.000.
Becker, Colman L.; and LeBlanc, Joseph R., to Pullman Incorporated. Low energy process for synthesis of ammonia. 4,230,680, Cl. 423-360.000.
Becker, Michael L., to A-T-O Inc. Adjustable stroke cylinder. 4,230,024, Cl. 92-13.100.
Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., to Appleton Papers Inc. Process for making form sets from carbonless copy paper sheets. 4,230,514, Cl. 156-305.000.
Beckman Instruments, Inc.: *See*—
Blanke, Gordon C., 4,230,554, Cl. 204-195.00T.
Beecham Group Limited: *See*—
Atkins, Herbert A., 4,230,232, Cl. 215-330.000.
Savidge, Thomas A.; and Powell, Lawson W., 4,230,804, Cl. 435-180.000.
Beedy, Robert G.: *See*—
Pierce, Paul, Jr.; and Beedy, Robert G., 4,230,035, Cl. 100-2.000.
Begasse, Beatrice: *See*—
Le Corre, Maurice; Hercouet, Alain; and Begasse, Beatrice, 4,230,624, Cl. 260-345.200.
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, to Thomson-CSF. Family of liquid crystals of the disubstitute diester type. 4,230,596, Cl. 252-299.000.
Behnke, Robert C., to Stanadyne, Inc. Internal combustion engine tappet comprising a sintered powdered metal wear resistant composition. 4,230,491, Cl. 75-243.000.
Belanger, Germain, to Bombardier Limited. Pool floor. 4,229,843, Cl. 4-495.000.
Bell & Howell Company: *See*—
Fleischman, Andor A., 4,230,397, Cl. 350-184.000.
Bell, Roy L.; Gillard, Dennis A.; Watt, Peter; Cartledge, Brian; Millhouse, Barry; Cheese, Michael E.; and Dring, Eric, to Coal Industry Limited. Equipment for laying a layer of elongate material. 4,230,371, Cl. 299-33.000.
Bell Telephone Laboratories, Incorporated: *See*—
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,230,553, Cl. 204-192.00E.
Boll, Harry J.; and Maul, Michael K., 4,230,958, Cl. 307-353.000.
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., 4,231,050, Cl. 357-16.000.
Hartman, Robert L.; Ilegems, Marc; Koszi, Louis A.; and Wagner, Wilfried R., 4,230,997, Cl. 331-94.50H.
Hunsberger, Dennis J.; Nahabedian, Charles E.; Quinn, Thomas M.; and VanOrnum, James H., 4,231,087, Cl. 364-200.000.
Miller, Stewart E., 4,230,473, Cl. 65-3.00A.
Semplak, Ralph A., 4,231,043, Cl. 343-786.000.
Turner, Dennis R., 4,230,538, Cl. 204-15.000.
Turrin, Richard H., 4,231,042, Cl. 343-786.000.
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., to Centurion Data Corporation. Business form with electrically conductive layer. 4,230,344, Cl. 283-6.000.
Bellinger, Robert M.; and Clayton, Hadwen A., to Phillips Petroleum Company. Compressor surge control system. 4,230,437, Cl. 415-1.000.
Bellus, Daniel: *See*—
Malherbe, Roger; Bellus, Daniel; and Gsell, Laurenz, 4,230,722, Cl. 424-301.000.
Belttari, Stanley C.; and Jacobson, Mark. Bottom face mill. 4,230,427, Cl. 407-91.000.
Belttary, Harold E., to Sylvania Circuit Breaker Corporation. Circuit breaker having a thermally responsive latching member. 4,231,006, Cl. 335-36.000.
Bendix Corporation, The: *See*—
Claxton, William B.; and Cromas, Joseph C., 4,230,273, Cl. 239-125.000.
Meyer, Donald E.; Colpaert, James J.; Fischer, Frederick R.; Gatt, Michael E.; and Koehler, David P., 4,230,252, Cl. 228-152.000.
Bendix Forest Products Corporation: *See*—
Orr, Robert P., 4,230,233, Cl. 217-36.000.
Benedyk, Joseph C., to Brunswick Corporation. Cigarette burn proof artificial grass. 4,230,752, Cl. 428-17.000.
Bennecke, Earl J.; and Bennecke, Mark R. Tank for cleaning and chemical treatment of boiler feedwater. 4,230,577, Cl. 210-85.000.
Bennecke, Mark R.: *See*—
Bennecke, Earl J.; and Bennecke, Mark R., 4,230,577, Cl. 210-85.000.
Benzie, Robert J.; and Waddan, Dhafir Y., to Imperial Chemical Industries Limited. Manufacture of organic nitriles. 4,230,634, Cl. 260-465.300.
Beresinsky, Isaac, to Moledeth Development Co., Ltd. Elevator-conveyor for bulk material. 4,230,221, Cl. 198-513.000.
Berezuk, Peter D.: *See*—
Wolinski, Leon E.; and Berezuk, Peter D., 4,230,613, Cl. 156-315.000.
Berg, Hermann O.; Gulden, Peter; Kostka, Hana; and Michel, Alfred, to Siemens Aktiengesellschaft. Vaporizing burner. 4,230,443, Cl. 431-328.000.
Bergamini, Michael V. W.: *See*—
Cooper, Charles A.; and Bergamini, Michael V. W., 4,230,724, Cl. 424-317.000.
Berger, Josef: *See*—
Gmeiner, Gunter; Frey, Egon; and Berger, Josef, 4,229,853, Cl. 15-250.160.
Berger, Rolf: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.
Bergwerksverband GmbH: *See*—
Jagnow, H. J., 4,230,528, Cl. 201-12.000.
Berkestad, Karl-Erik, to Stal-Laval Apparat AB. Heat exchange with separately supported and separately removable tubular coils. 4,230,177, Cl. 165-67.000.
Berky, Richard K., to Chromalloy American Corporation. Bale rolling machine. 4,229,934, Cl. 56-341.000.
Bernard, Roy A. Separable mower blade. 4,229,933, Cl. 56-295.000.
Bernasconi, Felix R., to BBC Brown, Boveri & Company, Limited. Locking mechanism for an adjustable spindle drive. 4,229,995, Cl. 74-625.000.
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased (by Schmid-Appenzelier, Kathe Anna, heir); by Baumann-Schmid, Mary Margrith, heir; by Schmid-Suter, Maria Albertine, heir; by Wawrla-Schmid, Jeannette Martha, heir; and by Schmid-Gautschi, Ernst Georges, heir, to Hoffmann-La Roche Inc. Pyrrolidine derivatives. 4,230,623, Cl. 260-326.5SM.
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Steroid derivatives and their use in radioimmunoassays. 4,230,621, Cl. 260-239.570.
Beroff, Howard, to Johnson & Johnson. Hub with suturing provision for medical devices. 4,230,110, Cl. 128-214.400.
Berryman, John E.; and Metzner, John W., to P.S.I. Fluid Power Ltd. Hydrostatic drive for lathes. 4,230,165, Cl. 144-209.00R.
Bertelsen, Corey A.; and Spars, Byron G., to Chevron Research Company. Removal of entrained solids from retorted hydrocarbonaceous vapors. 4,230,557, Cl. 208-8.00R.
Berthelon, Jean-Jacques: *See*—
Briet, Philippe; Berthelon, Jean-Jacques; and Depin, Jean-Claude, 4,230,850, Cl. 544-151.000.
Berthier, Pierre. Frame support for tool head. 4,229,866, Cl. 29-26.00A.
Bertrand, Jean-Noel M., to Labofina, S.A. Fire-retardant polystyrenic compositions. 4,230,821, Cl. 521-95.000.
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., to Ralston Purina Company. Intake limiting liquid feed supplement for ruminants. 4,230,736, Cl. 426-601.000.
Betz, Wolfgang; and Rossmann, Axel, to Motoren- und Turbinen-Union Munchen GmbH. Method of encapsulating a molded ceramic member. 4,230,745, Cl. 427-255.400.
Bhalla, Ranbir S., to Westinghouse Electric Corp. Color high-pressure sodium vapor lamp. 4,230,964, Cl. 313-220.000.
Bianchetta, Donald L.; and Schexnayder, Lawrence F., to Caterpillar Tractor Co. Hydraulic rock breaker circuit for an excavator. 4,230,022, Cl. 91-516.000.
Bianchi, Giuseppe: *See*—
Traini, Carlo; Bianchi, Giuseppe; and Pellegri, Alberto, 4,230,542, Cl. 204-93.000.
Bianchi, Maria L.: *See*—
Beacco, Enzo; Bianchi, Maria L.; Minghetti, Annacleto; and Spalla, Celestino, 4,230,854, Cl. 544-346.000.
BICC Limited: *See*—
Dean, Noel S.; Chapman, Joseph E. G.; and Williams, Eric L., 4,230,395, Cl. 350-96.230.
Bickley, Robert H.; and Dewey, Michael J., to Motorola, Inc. DC Coupled, wide band width high voltage modulator. 4,230,973, Cl. 315-383.000.
Bicskei, Bela J. Precision blocking of semi-finished lens blanks. 4,229,911, Cl. 51-284.00E.
Bielomatik Leuze & Co.: *See*—
Kunzmann, Otto, 4,230,218, Cl. 198-461.000.
Billington, Evans R.; Batka, Robert J.; and Korbilas, Christ P., to Rego Company. Thermal manual emergency shut off valve. 4,230,161, Cl. 141-302.000.
Bilton, Dennis E.: *See*—
Carter, Ned C.; Cramer, Jerry W.; and Bilton, Dennis E., 4,230,065, Cl. 118-17.000.

Binasik, Chester S.; Vosper, Ralph R.; and Harthun, Norman E., to Coen Company. Self contained compact burner. 4,230,449, Cl. 431-353.000.

Binder, Dieter: *See*—
Hromatka, Otto; and Binder, Dieter, 4,230,873, Cl. 549-64.000.

Biotechnologie Aktiengesellschaft fur Emulsan: *See*—
Gutnick, David L.; and Rosenberg, Eugene, 4,230,801, Cl. 435-101.000.

Bird, Carl H.: *See*—
Bird, Thomas O.; White, Jack; and Bird, Carl H., 4,230,585, Cl. 252-8.100.

Bird, Thomas O.; White, Jack; and Bird, Carl H., to White-Bird Enterprises, Inc. Fire-retardant cellulose insulation and process for making same. 4,230,585, Cl. 252-8.100.

Birrell, Peter L., to Acro-Matic, Inc. Cyclically operable dispenser providing a double closure between dispensing cycles. 4,230,239, Cl. 222-185.000.

Bisbing, Robert H., to Southco, Inc. Link and lever operated toggle latch mechanism. 4,230,351, Cl. 292-223.000.

Bjorgum, Keith D. Carpet door stop. 4,230,353, Cl. 292-343.000.

Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., to SAB Industri AB. Releasing device. 4,230,040, Cl. 102-13.000.

Blair, Bruce A.; and McClure, Howard G., to Lenco, Inc. Control circuit for a welding device. 4,230,929, Cl. 219-111.000.

Blank, Herbert: *See*—
Gunther, Herbert; and Blank, Herbert, 4,230,796, Cl. 430-523.000.

Blanke, Gordon C., to Beckman Instruments, Inc. Apparatus for measuring ions in solution. 4,230,554, Cl. 204-195.00T.

Blankenship, Michael G., to Corning Glass Works. System for delivering materials to deposition site on optical waveguide blank. 4,230,744, Cl. 427-163.000.

Blasbalg, Herman L., to International Business Machines Corporation. Anti-jam communications system. 4,231,113, Cl. 455-29.000.

Blaszczak, Larry C.: *See*—
Hatfield, Lowell D.; Blaszczak, Larry C.; and Fisher, Jack W., 4,230,644, Cl. 260-960.000.

Blatz, Philip S.: *See*—
Tanny, Stephen R.; and Blatz, Philip S., 4,230,830, Cl. 525-222.000.

Bloch, Alexander: *See*—
Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, 4,230,698, Cl. 424-180.000.

Blore, James H., to Phillips Petroleum Company. Double knit fabric. 4,229,954, Cl. 66-196.000.

Blum, Alvin S., to Medical Engineering Corp. Micro-hemostat. 4,230,119, Cl. 128-325.000.

Blum, Arnold: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.

Blytas, George C., to Shell Oil Company. Sulfur extraction method. 4,230,184, Cl. 166-312.000.

Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, to Research Corporation. 2-Substituted arabinofuranosyl nucleosides and nucleotides. 4,230,698, Cl. 424-180.000.

Bock, Dietrich W.: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Huber, Bernhard W., 4,230,665, Cl. 422-64.000.

Boe, Eldon L. Emergency prescription kit for travelers. 4,230,226, Cl. 206-570.000.

Boeing Commercial Airplane Company: *See*—
Arnold, Charles R.; and Pennington, Donald A., 4,230,614, Cl. 260-33.6PQ.
Hamm, Robert A.; and Whitener, Philip C., 4,230,293, Cl. 244-119.000.
Sealey, Francis; and Steadman, Stephen T., 4,230,352, Cl. 292-341.170.

Boeing Company, The: *See*—
Merrell, Hollis B., 4,230,016, Cl. 85-9.00R.

Boelkins, Wallace G., to Uni-Mist, Inc. Coupling for vacuum systems. 4,230,345, Cl. 285-7.000.

Boguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., to Miles Laboratories, Inc. Heterogenous specific binding assay employing a coenzyme as label. 4,230,797, Cl. 435-7.000.

Bohm, George G. A.; and Gross, Stanley S., to Firestone Tire & Rubber Company, The. Apparatus and method for continuous tread production. 4,230,649, Cl. 264-22.000.

Boileau, Jacques; and Mathevet, Albert, to Compagnie Generale des Etablissements Michelin. Nonreinforced tire having strengthened zones. 4,230,169, Cl. 152-353.00R.

Boll, Harry J.; and Maul, Michael K., to Bell Telephone Laboratories, Incorporated. Loss of clock detector circuit. 4,230,958, Cl. 307-353.000.

Bollen, Phillip S.: *See*—
Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,230,656, Cl. 264-171.000.

Bombardier Limited: *See*—
Belanger, Germain, 4,229,843, Cl. 4-495.000.

Bommersbach, Wolfgang; and Dean, Robert A., Jr., to Bach Laboratories, Inc. Musical instrument and method for use therein. 4,230,012, Cl. 84-1.010.

Bonazza, Benedict R.; and Schiff, Sidney, to Phillips Petroleum Company. Fuel and lubricant additives from aminoalkylalkanolamines. 4,230,588, Cl. 252-51.50A.

Bonmati, Reynald; Roz, Bernard; and Tollet de Santerre, Henri, to Societe Nationale Elf Aquitaine; and Societe de Recherches Techniques et Industrielles. Method for recycling a carrier gas from the trapping system to the inlet of a gas chromatographic separation unit. 4,230,464, Cl. 55-23.000.

Bonse, Dirk: *See*—
Weidenbach, Guenter; and Bonse, Dirk, 4,230,803, Cl. 435-176.000.

Booth, Inc.: *See*—
Booth, Jack J.; Branch, William C.; and Kidd, Robert P., 4,230,147, Cl. 137-504.000.

Booth, Jack J.; Branch, William C.; and Kidd, Robert P., to Booth, Inc. Constant flow valve. 4,230,147, Cl. 137-504.000.

Boots Company Limited, The: *See*—
Boulter, Clive, 4,230,236, Cl. 221-190.000.

Borello, Domenic. Continuous variable speed transmission. 4,229,985, Cl. 74-192.000.

Borg, Arne G.: *See*—
Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., 4,230,040, Cl. 102-13.000.

Borichevsky, Donald J., to Telescope Folding Furniture Co., Inc., The. Canopy for furniture frames. 4,230,363, Cl. 297-184.000.

Bornstein, L. F., to Georgia-Pacific Corporation. Composition for conditioning softwood logs prior to peeling operation. 4,230,600, Cl. 252-364.000.

Borowski, Kurt: *See*—
Wick, Richard; Stemme, Otto; Lermann, Peter; Wagner, Karl; Borowski, Kurt; Cocron, Istvan; and Fauth, Gunter, 4,230,400, Cl. 354-25.000.

Borregaard A/S: *See*—
Hasvold, Ketil, 4,230,524, Cl. 162-25.000.

Borruso, Joseph V., to Abex Corporation. Bulb mount for vehicle lamps. 4,231,081, Cl. 362-306.000.

Bosch, Mahlon L.; and McKelvy, Marvin D., to A. B. Chance Company. Tool for manual relocation of electrical cables. 4,230,357, Cl. 294-19.00R.

Bottelsen, Walter E. No bounce dart. 4,230,322, Cl. 273-420.000.

Bouge, Pierre M. J.: *See*—
Denay, Andre M. J.; and Bouge, Pierre M. J., 4,230,262, Cl. 229-69.000.

Boulon, Georges: *See*—
Vedrine, Alain; Gacon, Jean-Claude; Boulon, Georges; and Trottier, Danielle, 4,230,598, Cl. 252-301.40H.

Boulter, Clive, to Boots Company Limited, The. Tablet dispenser. 4,230,236, Cl. 221-190.000.

Bousaid, Issam S., to Texaco Inc. Oil recovery method employing alternate slugs of surfactant fluid and fresh water. 4,230,182, Cl. 166-273.000.

Bowden, Lloyd L.; and Dickinson, C. Burton, to Dickinson & Bowden Associates, Inc. Saddle clamp assembly. 4,229,863, Cl. 24-277.000.

Bowen, Mack D.; and Purdy, Kenneth R., to American Can Company. Process for producing highly activated carbonaceous products. 4,230,602, Cl. 252-421.000.

Box, John W.: *See*—
Burnett, Robert R.; and Box, John W., 4,230,231, Cl. 215-329.000.

Boyer, Norman W.: *See*—
Taylor, Robert S.; and Boyer, Norman W., 4,230,660, Cl. 264-311.000.

Boyne, Ralph A.; and Cottingham, Richard L., to Thormack Engineering Ltd. Flared combustion chamber. 4,230,447, Cl. 431-158.000.

Braat, Antonius M. M.; and Lagerwerf, Harry, to B. V. Neratoom. Heat exchanger with pump. 4,230,178, Cl. 165-76.000.

Braconi, Gustavo; and Valli, Giuseppe. Automatic apparatus for the treatment of links of metallic chains. 4,230,251, Cl. 228-41.000.

Bradley, Laird P., to United States of America, Energy. Pulse circuit apparatus for gas discharge laser. 4,230,994, Cl. 331-94.5PE.

Branch, William C.: *See*—
Booth, Jack J.; Branch, William C.; and Kidd, Robert P., 4,230,147, Cl. 137-504.000.

Brandin, Tore, to Stal Refrigeration AB. Refrigeration system. 4,229,949, Cl. 62-503.000.

Brastad, William A.; and Beall, Nelson J., to General Mills, Inc. Method and material for prepackaging food to achieve microwave browning. 4,230,924, Cl. 219-10.55E.

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Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,230,907, Cl. 179-1.00E.

Bray, Donald T.; and Tondreau, Raymond A., to Desalination Systems, Inc. Brine flow control for membrane separation system. 4,230,579, Cl. 210-101.000.

Brearley, Malcolm; and White, Alfred K., to Girling Limited. Anti-lock brake control system II. 4,230,376, Cl. 303-106.000.

Breda Termomeccanica S.p.A.: *See*—
Panzeri, Cesare, 4,229,908, Cl. 51-103.00R.

Brehm, Robert: *See*—
Munchinger, Bernd; and Brehm, Robert, 4,229,928, Cl. 53-452.000.

Brenner, Kurt H., Jr., to GTE Products Corporation. Means for positioning an electrical contactor on a CRT mask assembly. 4,230,965, Cl. 313-407.000.

Breslow, Jeffrey D.; Hicks, Alan A.; Jaworski, Eugene; and Meyer, Burton C., to Marvin Glass & Associates. Sound actuated competitive game apparatus. 4,230,317, Cl. 273-119.00A.

Bretz, John; and Cech, Leonard S., to Lubrizol Corporation, The. Aqueous well-drilling fluids. 4,230,586, Cl. 252-8.50P.

Brickman, Eugene L.: *See*—
Seto, Rodney K. M.; Brickman, Eugene L.; and Fitzgibbons, Michael R., 4,230,187, Cl. 166-362.000.

Bridgestone Tire Co., Ltd.: *See*—
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, 4,230,168, Cl. 152-310.000.
Makino, Shigeo; Sugimura, Norboru; and Aoki, Shigeta, 4,230,512, Cl. 152-209.00R.

Briet, Philippe; Berthelon, Jean-Jacques; and Depin, Jean-Claude, to LIPHA, Lyonnaise Industrielle Pharmaceutique. 3-Substituted-4-amincalkoxy-5,6-condensed ring-2-pyranones. 4,230,850, Cl. 544-151.000.

Briggs, Richard L.; and Meacham, Sterling A., to United States of America, Energy. Liquid sodium dip seal maintenance system. 4,230,526, Cl. 176-38.000.

Brobeck, Glenn H. Portable pipe cleaning apparatus. 4,229,852, Cl. 15-3.500.

Broderick, Thomas E.: *See*—
Hauenstein, Jack D.; and Broderick, Thomas E., 4,230,819, Cl. 528-483.000.

Brois, Stanley J.; and Ver Strate, Gary, to Exxon Research & Engineering Co. Olefin containing polymers treated with oxycarbonylsulfenyl halides. 4,230,837, Cl. 525-343.000.

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Pickering, Norman C.; and Bronson, Nathaniel R., II, 4,230,124, Cl. 128-660.000.

Brooks, Henry W.; and Nichol, Gloria C., to Nichol, Gloria C. Combined eating utensil. 4,229,880, Cl. 30-142.000.

Brooks, Kenneth R., to Otis Elevator Company. Transistorized elevator control button. 4,230,206, Cl. 187-29.00R.

Brothers, Gene A.; Neely, John A.; and Kieffe, Patrick W., to Eltra Corporation. Line concentrator. 4,230,913, Cl. 179-18.0FC.

Broughton, Roy M., Jr.; Callander, Douglas D.; Pengilly, Brian W.; Schirmer, Joseph P.; and Winters, Terence E., to Goodyear Tire & Rubber Company, The. Reduction of glycol ethers in polyesters. 4,230,818, Cl. 528-272.000.

Brown, George R.; Carroll, Joseph C.; and Dubuisson, S. Elliott, to Texaco Inc. Submerged offshore storage facility. 4,230,422, Cl. 405-210.000.

Brown, Michael J.: *See*—
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., 4,230,484, Cl. 71-111.000.

Brown, Patricia A.: *See*—
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Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., 4,230,514, Cl. 156-305.000.

Brown & Root, Inc.: *See*—
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Brubaker, Gaylen R.: *See*—
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,230,591, Cl. 252-102.000.

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Gorman, Ralph E.; and Bruce, Robert W., 4,230,268, Cl. 237-51.000.

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Coralli, Giorgio V.; and Brunelli, Alessandro, 4,229,955, Cl. 70-32.000.

Brunswick Corporation: *See*—
Benedyk, Joseph C., 4,230,752, Cl. 428-17.000.

Buchwald, Hubert W.; and Houle, Peter C., to TII Corporation. Apparatus for removing foam. 4,230,467, Cl. 55-178.000.

Buckley, Lawrence W., to National Instrument Company, Inc. Adjustable suck-back device for sanitary pumps. 4,230,160, Cl. 141-116.000.

Buckner, Carrol E., to Smoky Mountain Enterprises, Inc. Fireplace door. 4,230,093, Cl. 126-190.000.

Buehrle, William B., to Engineered Systems, Inc. Communications system with repeater stations. 4,230,989, Cl. 375-4.000.

Bull, David W., to Nartron Corporation. Lamp assembly light shield and retaining means. 4,231,082, Cl. 362-368.000.

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Bullard, Herbert L.; and Osborn, Robert A., to Goodyear Tire & Rubber Company, The. Hydrocarbon resin. 4,230,842, Cl. 526-185.000.

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Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,230,072, Cl. 123-1.00A.

Bundy, Gordon L., to Upjohn Company, The. 16-Phenoxy-9-deoxy-9-methylene-PGF compounds. 4,230,629, Cl. 260-404.000.

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Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., to Petrolite Corporation. Quaternary ammonium adducts of polymerizable tertiary ammonium salts and acrylonitrile. 4,230,839, Cl. 526-75.000.

Burke, Edward F., Jr., to MFE Corporation. Two-axis optical scanner. 4,230,393, Cl. 350-6.500.

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Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,230,344, Cl. 283-6.000.

Burkert GmbH: *See*—
Dettmann, Heinrich; and Mehrer, Otto, 4,230,143, Cl. 137-270.000.

Burkholder, Ward J., to Goodyear Tire & Rubber Company, The. Method of recovering dialkylbenzene dihydroperoxide. 4,230,890, Cl. 568-576.000.

Burki, Arthur G.: *See*—
Logan, Clifford K., Jr., 4,230,193, Cl. 175-379.000.

Burnett, Robert R.; and Box, John W., to Coulter Electronics, Inc. Closure cap. 4,230,231, Cl. 215-329.000.

Burnham, Ralph L., to United States of America, Navy. Electrically excited mercury halide laser. 4,230,995, Cl. 331-94.50G.

Burnstein, Philip J.; Pariza, George R.; and Siegel, Stephen L., to Pittway Corporation. Integral contact. 4,230,383, Cl. 339-17.00R.

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Burroughs Corporation: *See*—
Holz, George E.; Ogle, James A.; and Przybylek, George J., 4,230,967, Cl. 315-3.000.
Templeton, William B., 4,230,312, Cl. 271-215.000.

Burroway, Gary L.; and Maximovich, Michael J., to Goodyear Tire & Rubber Company, The. Water reducible coating compositions. 4,230,609, Cl. 260-29.6TA.

Burton, Allen H. Method and device for facilitating the watering of hanging plants. 4,229,904, Cl. 47-58.000.

Bush Universal, Inc.: *See*—
Stanton, Leo F., 4,229,851, Cl. 12-146.00S.

Bustard, Thomas S.; and Pohl, Corriene S., to Hittman Corporation. Conversion of radioactive waste materials into solid form. 4,230,597, Cl. 252-301.10W.

Butler, Glenn J., to IUC International, Inc. Rail system and gas metering system in a hyperbaric system. 4,230,107, Cl. 128-205.260.

Butler, Jack O.: *See*—
Butler, Payson M.; and Butler, Jack O., 4,230,325, Cl. 277-117.000.

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Byars, Mark L.: *See*—
Paradise, William L., Jr.; and Byars, Mark L., 4,230,732, Cl. 426-393.000.

Byers, Thomas L. Oscillating plate animated motion display machine. 4,229,895, Cl. 40-614.000.

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Morris, Robert W., 4,230,755, Cl. 428-95.000.

Cais, Michael, to Technion Research & Development Foundation Ltd. Test pack kit for immunoassay. 4,230,664, Cl. 422-61.000.

Calfo, Raymond M.; and Mulach, Arthur, to Westinghouse Electric Corp. Magnetic flux sensor for laminated cores. 4,230,961, Cl. 310-68.00R.

Calgon Corporation: *See*—
Falcione, Ronald J.; McManis, Ronald R.; and Aufman, Joseph A., 4,230,610, Cl. 260-29.60M.

Caliri, Charles T., to Jamesbury Corporation. Pneumatic actuator. 4,230,025, Cl. 92-31.000.

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Broughton, Roy M., Jr.; Callander, Douglas D.; Pengilly, Brian W.; Schirmer, Joseph P.; and Winters, Terence E., 4,230,818, Cl. 528-272.000.

Cambridge, Edward L.: *See*—
Archer, Anthony M.; Cambridge, Edward L.; and Hewgill, Douglas F., 4,230,540, Cl. 204-67.000.

Camilleri, Thomas M. Positive turret indexing apparatus. 4,230,315, Cl. 273-54.00R.

Campo, Edgar A.; and Lewis, Robert B., to Du Pont de Nemours, E. I., and Company. Material converger. 4,229,861, Cl. 19-161.100.

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Mag, Theodore K.; and Reid, Margaret P., 4,230,630, Cl. 260-428.000.

Canizares, Hugo M.: *See*—
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Aoki, Takao; Kadowaki, Hidejiro; and Iwami, Naoki, 4,230,783, Cl. 430-42.000.
Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, 4,230,403, Cl. 354-286.000.
Tsuji, Sadahiko; and Sato, Yasuhisa, 4,230,398, Cl. 350-184.000.
Uchiyama, Takashi; Nakamura, Zenzo; and Ohtaki, Shohei, 4,230,402, Cl. 354-33.000.

Canterino, Peter J., to Mobil Oil Corporation. Chemically cross-linked poly(p-methylstyrene). 4,230,836, Cl. 525-332.000.

Capaccioni, Mario; Gentile, Laurentino; and Rusconi, Aldo, to Montedison S.p.A. Method of preparation of improved nigrosine and indulino dyes. 4,230,855, Cl. 544-348.000.

Capuano, Italo A.; and Turley, Patricia A., to Olin Corporation. Process for removal and recovery of mercury from liquids. 4,230,486, Cl. 75-81.000.

Carda, Edward E. Brush plate assembly. 4,230,962, Cl. 310-239.000.

Cardin, Wilfred W., to Texas Instruments Incorporated. Thermostatic switch employing a stud member for calibration of the switch. 4,231,010, Cl. 337-94.000.
Cargill Incorporated: *See*—
Gordon, Robert; Weingart, Oscar; King, Harry A.; and Springrose, James V., 4,230,048, Cl. 105-248.000.
Carl, David F.; and Drone, Gary A., to Fiat-Allis Construction Machinery, Inc. Multi-function control valve. 4,230,152, Cl. 137-596.000.
Carl Still, Firma: *See*—
Weber, Heinrich; and Tippmer, Kurt, 4,230,594, Cl. 252-188.000.
Carlew Chemicals Limited: *See*—
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Carlson, Lee A.; and Miekka, Richard G., to Dennison Manufacturing Company. Pressure sensitive adhesive elecrophotographic reproduction sheets. 4,230,785, Cl. 430-56.000.
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Judge, Kenneth E.; and Hayter, Jerald D., 4,230,091, Cl. 126-77.000.
Carolan, Donald L., to Deere & Company. Two-stage deadman control for walk-behind mowers. 4,230,200, Cl. 180-272.000.
Carr, Norman L.; and Schmid, Bruce K., to Gulf Oil Corporation. Integrated coal liquefaction-gasification process. 4,230,556, Cl. 208-8.0LE.
Carre, Jean-Jacques: *See*—
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Carrico, Robert J.: *See*—
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Carroll, Joseph C.: *See*—
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Carter Bros. Iron Works, Inc.: *See*—
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Carter, Michael R. L.: *See*—
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Carter, Ned C.; Cramer, Jerry W.; and Bilton, Dennis E., to Sunkist Growers, Inc. Apparatus for printing and protecting ink indicia on fruits. 4,230,065, Cl. 118-17.000.
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Cartledge, Brian W.; Millhouse, Barry; and Cheese, Michael E., to Coal Industry (Patents) Limited. Equipment for laying elongate material. 4,230,370, Cl. 299-33.000.
Carver, Earl D. Snow chain bracket for vehicle wheel. 4,230,167, Cl. 152-233.000.
Casaly, Richard J., to Transaction Technology, Inc. Adaptive threshold optical reader. 4,230,265, Cl. 235-455.000.
Cascade Corporation: *See*—
Seaberg, Richard D., 4,230,434, Cl. 414-607.000.
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., to Bell Telephone Laboratories, Incorporated. Reduction of surface recombination current in GaAs devices. 4,231,050, Cl. 357-16.000.
Casey, Kenneth W.: *See*—
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Cassagne, Pierre, to MATRA. Remote reproduction of images. 4,231,095, Cl. 364-515.000.
Castejon Castan, Luis M. Fluid arrangement. 4,230,019, Cl. 91-220.000.
Caterpillar Tractor Co.: *See*—
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Crews, Donald R., 4,230,176, Cl. 165-67.000.
Hart, Cullen P.; and Meisel, Thomas C., Jr., 4,230,341, Cl. 280-702.000.
Jedlicka, Daniel M., 4,229,951, Cl. 64-14.000.
Proeschl, Bernard E., 4,230,254, Cl. 228-182.000.
Purcell, Robert J.; and Sturges, James R., 4,230,378, Cl. 305-22.000.
Stedman, Robert N., 4,230,199, Cl. 180-9.20R.
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Cech, Leonard S.: *See*—
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Celanese Corporation: *See*—
Charbonneau, Larry F., 4,230,817, Cl. 528-206.000.
Mitchell, William T.; and Snyder, Phillip S., 4,230,887, Cl. 562-593.000.
Cella, Alexander. Steam generator for use in nuclear power plants. 4,230,527, Cl. 176-87.000.
Cellcor Corporation of Canada Limited: *See*—
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Cenci, Harry J.: *See*—
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Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,230,344, Cl. 283-6.000.
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Ceserani, Roberto: *See*—
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Chalmers, Dennis W., to Hayward Tyler Pump Company. Seismic support for pendantly suspended body. 4,230,144, Cl. 137-343.000.
Chambe, Maurice. Apparatus for the thermal treatment of organic materials. 4,230,451, Cl. 432-72.000.
Chamberlin, James W.: *See*—
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Champagne, Gaston, to Cogan Wire & Metal Products (1974) Limited. Corner support for a shelving system. 4,230,052, Cl. 108-144.000.
Champion International Corporation: *See*—
Austin, John J., 4,230,261, Cl. 229-52.00B.
Chan, David C. K., to Chevron Research Company. Fungicidal, miticidal and ovicidal alkoxycarbonylalkyl-substituted and carbamylalkyl-substituted N-haloalkylthiosulfonamides. 4,230,875, Cl. 560-12.000.
Chang, David C.; Fryd, Michael; and Krueger, Achim R., to Du Pont de Nemours, E. I., and Company. Processes for the preparation of polymeric thickeners and uses thereof. 4,230,844, Cl. 526-210.000.
Chang, Donlly. Inflatable automobile warning reflector. 4,230,063, Cl. 116-63.00T.
Chang, Eppie S., to Miles Laboratories, Inc. Unitized uric acid test composition and device. 4,230,798, Cl. 435-10.000.
Chang, Uck I.; and Casey, Kenneth W., to Ford Motor Company. Laser welding method for electrical wire connection to a terminal pin of an exhaust gas sensor. 4,230,930, Cl. 219-121.0LD.
Chapman, Charles C.; and Van Pool, Joe, to Phillips Petroleum Company. Hydrocarbon purification apparatus. 4,230,666, Cl. 422-106.000.
Chapman, Dwain R., to SWS Silicones Corporation. Preparation of heat stable silicone fluids. 4,230,632, Cl. 556-401.000.
Chapman, Jay P., to Bechtel International Corporation. Back pressure system for slurry pipeline. 4,230,153, Cl. 137-599.000.
Chapman, Joseph E. G.: *See*—
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Chappell, Christopher L., to Stablex A.G. Treatment of hazardous waste. 4,230,568, Cl. 210-751.000.
Charbonneau, Larry F., to Celanese Corporation. Thermotropic polyesters derived from ferulic acid and a process for preparing the polyesters. 4,230,817, Cl. 528-206.000.
Charles, Richard J., to Paper Converting Machine Company. Core holder for reeling. 4,230,286, Cl. 242-68.600.
Chartier, Eldrick D. Cutter head and cutters for a vegetation cutting tool. 4,229,882, Cl. 30-276.000.
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Chen, Anthony H.: *See*—
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Cherry Electrical Products Corp.: *See*—
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Cherry, Gordon E.: *See*—
Cunningham, Cecil R.; Fulmer, Ray M.; and Cherry, Gordon E., 4,230,284, Cl. 242-18.00G.
Cherry, Peter C.; Gregory, Gordon I.; and Ward, Peter, to Glaxo Laboratories Limited. Halogen derivatives of clavulaic acid. 4,230,622, Cl. 260-245.300.
Cheshire, Ernest L., to UOP Inc. Ratchet-action hinge device 4,230,414, Cl. 403-95.000.
Chevron Research Company: *See*—
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Chan, David C. K., 4,230,875, Cl. 560-12.000.
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Chiolle, Antonio; Gianotti, Giuseppe; and Parrini, Gianfranco. Supported anisotropic reverse osmosis membranes based on synthetic polyamides and processes for their preparation. 4,230,583, Cl. 210-490.000.
Chiou, Chuang-Min. Structure of vertical and horizontal surveying instrument. 4,229,885, Cl. 33-376.000.

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Chorvat, Robert J., to G. D. Searle & Co. 25-Halocholest-5-ene-3β,22-diols and esters thereof. 4,230,626, Cl. 260-397.200.
Chou, Ta S., to Eli Lilly and Company. Process for preparing penicillin sulfoxides. 4,230,620, Cl. 260-239.100.
Chow, Fred I., to Brown & Root, Inc. Semi-submersible pipelaying vessel having an improved pipelaying path. 4,230,420, Cl. 405-166.000.
Choy, Sue. Hair grooming composition of matter. 4,230,689, Cl. 424-74.000.
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Chung, Daniel A.: *See*—
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Chupp, Thomas M., Jr. Exercise device. 4,230,313, Cl. 272-93.000.
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Church's Fried Chicken, Inc.: *See*—
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Ciba-Geigy Corporation: *See*—
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Losert, Ewald; and Rembold, Heinz, 4,230,793, Cl. 430-315.000.
Malherbe, Roger; Bellus, Daniel; and Gsell, Laurenz, 4,230,722, Cl. 424-301.000.
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Howard, James; and Gombar, Oscar J., 4,230,501, Cl. 106-308.00Q.
Citizen Watch Company Limited: *See*—
Mizutani, Nagao; Kurihara, Toshio; Nishiyama, Yutaka; Kunita, Masao; Kinoshita, Teruo; and Yasunaga, Makoto, 4,230,039, Cl. 101-93.170.
Claras, Eleanor. Pick up and disposal kit for pet ordure. 4,230,354, Cl. 294-1.00B.
Clark, Donald L.; and Graves, William P., to GTE Products Corporation. Address data converter. 4,231,021, Cl. 340-347.0DD.
Clark, John E., Jr. Wall assembly. 4,229,922, Cl. 52-586.000.
Clark, Philip G. Grain conveyor assembly. 4,230,222, Cl. 198-580.000.
Clark, Robert L., to Textron, Inc. Cam shaft manufacturing process. 4,230,506, Cl. 148-3.000.
Claude, Jacques: *See*—
Beaussant, Raymond; and Claude, Jacques, 4,230,097, Cl. 128-1.00A.
Claxton, William B.; and Cromas, Joseph C., to Bendix Corporation, The. Fuel injection valve and single point system. 4,230,273, Cl. 239-125.000.
Clayton, Hadwen A.: *See*—
Bellinger, Robert M.; and Clayton, Hadwen A., 4,230,437, Cl. 415-1.000.
Cleary, James M., Jr. Method for displacing large blocks of earth. 4,230,368, Cl. 259-2.000.
Clupak, Inc.: *See*—
Groome, Ernest J., 4,230,036, Cl. 100-35.000.
Clure, Tommy: *See*—
Comer, O. Lawrence; Muse, Wyndell G.; and Clure, Tommy, 4,230,297, Cl. 248-317.000.
Coal Industry Limited: *See*—
Bell, Roy L.; Gillard, Dennis A.; Watt, Peter; Cartledge, Brian; Millhouse, Barry; Cheese, Michael E.; and Dring, Eric, 4,230,371, Cl. 299-33.000.
Coal Industry (Patents) Limited: *See*—
Cartledge, Brian W.; Millhouse, Barry; and Cheese, Michael E., 4,230,370, Cl. 299-33.000.
Cobb, A. Lawrence; and DuBrock, Leland D., to Composite Technology Corporation. Foam impregnating apparatus. 4,230,521, Cl. 156-549.000.
Coburn, Robert E., to Molins Machine Company, Inc. Rotary tool positioner. 4,230,009, Cl. 83-504.000.
Cocron, Istvan: *See*—
Wick, Richard; Stemme, Otto; Lermann, Peter; Wagner, Karl; Borowski, Kurt; Cocron, Istvan; and Fauth, Gunter, 4,230,400, Cl. 354-25.000.
Coen Company: *See*—
Binasik, Chester S.; Vosper, Ralph R.; and Harthun, Norman E., 4,230,449, Cl. 431-353.000.
Coenen, Alfred; Kosswig, Kurt; Hentschel, Bernhard; and Ziebarth, Jurgen, to Chemische Werke Huls AG. Method of manufacturing hydrogen chloride from solutions of amine hydrochlorides. 4,230,681, Cl. 423-481.000.
Cogan Wire & Metal Products (1974) Limited: *See*—
Champagne, Gaston, 4,230,052, Cl. 108-144.000.
Cohen, Eric S.: *See*—
Korwin, Paul; and Cohen, Eric S., 4,230,914, Cl. 179-81.00E.
Cohen, Martin M.: *See*—
Hansen, Walter I.; Galbraith, Wiley E.; Vella, Louis C.; and Cohen, Martin M., 4,231,096, Cl. 364-523.000.
Coleman, Lester F., to Lubrizol Corporation, The. Polymeric compositions, method for their preparation, and lubricants containing them. 4,230,843, Cl. 526-204.000.
Colgate Palmolive Company: *See*—
Wixon, Harold E., 4,230,590, Cl. 252-97.000.
Collins, James R. Fishing apparatus. 4,229,900, Cl. 43-43.110.
Colpaert, James J.: *See*—
Meyer, Donald E.; Colpaert, James J.; Fischer, Frederick R.; Gatt, Michael E.; and Koehler, David P., 4,230,252, Cl. 228-152.000.
Colt Industries Operating Corp.: *See*—
Dodson, Robert W., 4,230,645, Cl. 261-19.000.
Combustion Electromagnetics, Inc.: *See*—
Ward, Michael A. V.; and Kern, Fred R., 4,230,448, Cl. 431-208.000.
Comer, O. Lawrence; Muse, Wyndell G.; and Clure, Tommy, to Metalux Corporation. Mounting bracket for fluorescent fixtures and the like. 4,230,297, Cl. 248-317.000.
Commissariat a l'Energie Atomique: *See*—
Gaussens, Gilbert; Lemaire, Francis; and Van Nguyen, Bach, 4,230,766, Cl. 428-288.000.
Commonwork Enterprises Limited: *See*—
Dodson, Christopher, 4,230,580, Cl. 210-170.000.
Compagnie Generale des Etablissements Michelin: *See*—
Boileau, Jacques; and Mathevet, Albert, 4,230,169, Cl. 152-353.00R.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See*—
Aldea, Jacques; Eltgen, Jean-Jacques; and Thiollier, Gabriel, 4,230,069, Cl. 118-653.000.
Compen, Johannes M. A. A., to U.S. Philips Corporation. Metal strip attached to high voltage contact with getter at one end and contact to shield cone at the other. 4,230,966, Cl. 313-481.000.
Composite Technology Corporation: *See*—
Cobb, A. Lawrence; and DuBrock, Leland D., 4,230,521, Cl. 156-549.000.
Compton, Wayne W., to Kim Lighting, Inc. Luminaire with reflecting louvers. 4,231,080, Cl. 362-298.000.
Compugraphic Corporation: *See*—
Gardella, John F., Jr.; King, George W.; Kolm, Eric A.; and Kolm, Henry H., 4,230,978, Cl. 318-687.000.
Comroe, Stephen S. Fish grabber for use in electrical wire installation. 4,230,305, Cl. 254-134.3FT.
Connolly, Arlene D.; Eshleman, James M.; and Knaub, Edgar W., to Armstrong Cork Company. Cleaning composition for no-wax vinyl composition floor covering. 4,230,605, Cl. 252-545.000.
Connor, David T.: *See*—
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,230,707, Cl. 424-251.000.
Conoco, Inc.: *See*—
Wingrave, James A., 4,230,604, Cl. 252-518.000.
Continental Group, Inc., The: *See*—
Flajnik, Louis, 4,230,223, Cl. 198-817.000.
Conway, John W.: *See*—
Tarbox, Bruce H.; Bruce, Kenneth E.; Conway, John W.; and Lombardo, Ralph M., Jr., 4,231,086, Cl. 364-200.000.
Cook, Curtis H., Jr., to United Technologies Corporation. Nozzle array for chemical lasers. 4,230,996, Cl. 331-94.50D.
Cooke, Victor F. G.; and Thorpe, Donald H., to Hooker Chemicals & Plastics Corp. Low profile polyester molding composition. 4,230,813, Cl. 526-329.000.
Cooper, Alan: *See*—
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,230,847, Cl. 536-10.000.
Cooper, Charles A.; and Bergamini, Michael V. W., to Allergan Pharmaceuticals, Inc. Method of treating vascularization of the eye with Flurbiprofen. 4,230,724, Cl. 424-317.000.
Coors Container Company: *See*—
Vischer, Peter, 4,230,476, Cl. 65-128.000.
Copley, Russell D.: *See*—
Schlueter, Francis E.; Copley, Russell D.; and Sanderson, Leon F., 4,229,931, Cl. 56-10.200.
Coralli, Giorgio V.; and Brunelli, Alessandro, to Viro Innocenti S.p.A. Lock for roller shutters. 4,229,955, Cl. 70-32.000.
Cornelius, John F.: *See*—
Lert, John G., Jr.; Lert, Peter W.; and Cornelius, John F., 4,230,990, Cl. 455-67.000.
Cornell Research Foundation, Inc.: *See*—
Pang, Songja; and New, Maria I., 4,230,684, Cl. 424-1.000.
Corning Glass Works: *See*—
Blankenship, Michael G., 4,230,744, Cl. 427-163.000.
Olshansky, Robert; and Sarkar, Arnab, 4,230,396, Cl. 350-96.310.
Schultz, Peter C., 4,230,472, Cl. 65-3.00A.
Corrigan, James L., to Armstrong Cork Company. Ceiling display. 4,229,913, Cl. 52-38.000.
Cortez, Armando G. Coin operated cigarette case. 4,230,214, Cl. 194-59.000.
Cose Technology Corporation: *See*—
Korwin, Paul; and Cohen, Eric S., 4,230,914, Cl. 179-81.00E.
Cosmopolitan Textile Company Limited: *See*—
Warsop, David H., 4,229,953, Cl. 66-193.000.

Cosyns, Jean; Stern, Robert; and Le Page, Jean-Francois, to Institut Francais du Petrol. Process for selectively hydrogenating a hydrocarbon cut containing at least one diolefinic hydrocarbon and at least one acetylenic hydrocarbon using a palladium catalyst with crystallites of at least 50 angstroms. 4,230,897, Cl. 585-260.000.

Cote, Renald A. Orthopedic device. 4,230,103, Cl. 128-80.00A.

Cottingham, Richard L.: *See*—
Boyne, Ralph A.; and Cottingham, Richard L., 4,230,447, Cl. 431-158.000.

Coulter Electronics, Inc.: *See*—
Burnett, Robert R.; and Box, John W., 4,230,231, Cl. 215-329.000.
Fulwyler, Mack J., 4,230,558, Cl. 209-3.100.
Pedroso, Raul I.; and Auer, Robert E., 4,230,031, Cl. 98-115.0LH.

Coulter, Leland E., to Teledyne, Inc. Protective shell for nuclear reactor and method for assembling the shell. 4,230,255, Cl. 228-184.000.

Cox, Monty S.: *See*—
Staley, Gary M.; and Cox, Monty S., 4,230,296, Cl. 248-309.00R.

Cox, William J.; and Hagale, James A. Warm-up sleeve. 4,229,833, Cl. 2-16.000.

Crain Cutter Co., Inc.: *See*—
Crain, Millard, Jr., 4,230,302, Cl. 254-212.000.

Crain, Millard, Jr., to Crain Cutter Co., Inc. Carpet stretcher. 4,230,302, Cl. 254-212.000.

Cram, Robert D., to High Voltage Engineering Corporation. Apparatus for treating flowable material. 4,230,947, Cl. 250-434.000.

Cramer, Jerry W.: *See*—
Carter, Ned C.; Cramer, Jerry W.; and Bilton, Dennis E., 4,230,065, Cl. 118-17.000.

Creekmore, Mark D.: *See*—
Watts, William A.; and Creekmore, Mark D., 4,230,607, Cl. 260-23.0XA.
Watts, William A.; and Creekmore, Mark D., 4,230,774, Cl. 428-518.000.

Crew, Norman W., Jr. Game board with corresponding cards. 4,230,320, Cl. 273-243.000.

Crews, Donald R., to Caterpillar Tractor Co. Floating radiator tank top. 4,230,176, Cl. 165-67.000.

Cribben, James T.; and Feeser, Richard A., to Ethyl Corporation. Swimming pool coping. 4,229,844, Cl. 52-588.000.

Crisci, Harry, to Northern Engineering & Plastics Corporation. Snap on bottle cap. 4,230,229, Cl. 215-253.000.

Crisp, David, to Rizla Limited. Cigarette making machine. 4,230,132, Cl. 131-70.000.

Crispell, Corey F., to SPS Technologies, Inc. Method of prestressing bolts. 4,229,875, Cl. 29-452.000.

Crivello, James V., to General Electric Company. Heat curable compositions. 4,230,814, Cl. 526-333.000.

Crocker, Zenas; and Gupta, Ved P., to Carlew Chemicals Limited. Process for controlled mixing in a high intensity mixer. 4,230,615, Cl. 260-34.200.

Cromas, Joseph C.: *See*—
Claxton, William B.; and Cromas, Joseph C., 4,230,273, Cl. 239-125.000.

Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Imidazole therapeutic agents. 4,230,714, Cl. 424-263.000.

Crowther, Gerald O.; Douglas, Terence A.; and Farmer, Howard M., to U.S. Philips Corporation. Remote control system capable of transmitting the information with the aid of an infra red beam using PPM or an ultrasonic beam using PDM. 4,231,031, Cl. 340-695.000.

Crum, Ronald J.; and Churchill, Edward J. Stereophonic system with discrete bass channels. 4,230,905, Cl. 179-1.0GA.

Cuccia, Bernard. Infusion device. 4,230,033, Cl. 99-289.00R.

Cugini, John J.: *See*—
Cugini, Larry, Sr.; and Cugini, John J., 4,230,513, Cl. 156-299.000.

Cugini, Larry, Sr.; and Cugini, John J. Method and apparatus for making raised and flat letter signs. 4,230,513, Cl. 156-299.000.

Culp, Richard E.; and Baker, Robert G., to Jet, Inc. Sewage effluent volume control and alarm arrangement for pressurized sewage disposal system. 4,230,578, Cl. 210-86.000.

Culter, Robert G., to Tektronix, Inc. Color-pulling compensation in a beam-index display tube. 4,231,060, Cl. 358-69.000.

Cundari, Sante M.: *See*—
Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M., 4,230,053, Cl. 110-346.000.

Cunningham, Cecil R.; Fulmer, Ray M.; and Cherry, Gordon E., to Owens-Corning Fiberglas Corporation. Method and apparatus for collecting strands. 4,230,284, Cl. 242-18.00G.

Cusano, Dominic A.; and Prener, Jerome S., to General Electric Company. Distributed phosphor scintillator structures. 4,230,510, Cl. 156-67.000.

Custode, Frank Z.; and Tam, Matthias L., to Rockwell International Corporation. Process for producing minimal geometry devices for VSLI applications utilizing self-aligned gates and self-aligned contacts, and resultant structures. 4,231,051, Cl. 357-23.000.

Dadd, Robert C. Ozone/ultraviolet water purification. 4,230,571, Cl. 210-760.000.

D'Agostino, Vincent F.; Lee, Joseph Y.; and Sentisi, Joseph C., to RAI Research Corporation. Separator membranes for electrochemical cells. 4,230,549, Cl. 204-159.170.

Daimler-Benz Aktiengesellschaft: *See*—
Gmeiner, Gunter; Frey, Egon; and Berger, Josef, 4,229,853, Cl. 15-250.160.

Dale Electronics, Inc.: *See*—
Kneifel, Jerome J.; and Veburg, John C., 4,229,967, Cl. 73-15.00R.

Daly, Francis P., to Hydrocarbon Research, Inc. Thermal hydrodealkylation of alkyl phenols. 4,230,895, Cl. 568-805.000.

Daly, Francis P., to Hydrocarbon Research, Inc. Catalytic steam dealkylation of alkyl phenols. 4,230,896, Cl. 568-805.000.

Dandage, Subhash R.: *See*—
Cattorini, Joseph F.; and Dandage, Subhash R., 4,229,982, Cl. 74-63.000.

Dapco Industries, Inc.: *See*—
Sholl, Howard A.; and Marshall, John T., 4,229,978, Cl. 73-626.000.

Darnell, Eric. Heating stove. 4,230,090, Cl. 126-72.000.

Darwent, Richard H., to Westinghouse Electric Corp. Elevator system. 4,230,205, Cl. 187-22.000.

Datapower, Inc.: *See*—
Gerhard, Francis H.; and Felper, Gerald A., 4,230,971, Cl. 315-307.000.

Davis, Charles R., to Time and Space Processing, Inc. Speech digitizer. 4,230,906, Cl. 179-1.0SA.

Davis, John Christopher H.; and Hatherill, Richard A., to Plessey Canada Limited. Telephone summing circuit. 4,230,908, Cl. 179-1.0CN.

Davis & Wilder, Inc.: *See*—
Zajac, John, 4,230,515, Cl. 156-345.000.

Davison, Samuel H., to General Electric Company. Rotor/shroud clearance control system. 4,230,436, Cl. 415-1.000.

Day, Derek J.; and Elliot, Charles T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus for parallel-in to serial-out conversion. 4,231,052, Cl. 357-24.000.

Day, Timothy T., to J. Sainsbury Limited. Process and apparatus for vacuum packing. 4,229,927, Cl. 53-433.000.

De Laval Turbine Inc.: *See*—
Ogle, Francis H., Jr., 4,230,148, Cl. 137-512.100.

Dean, Edward H.: *See*—
Figge, Irving E.; and Dean, Edward H., 4,230,764, Cl. 428-268.000.

Dean, Noel S.; Chapman, Joseph E. G.; and Williams, Eric L., to BICC Limited. Optical cables with loosely housed optical guides. 4,230,395, Cl. 350-96.230.

Dean, Robert A., Jr.: *See*—
Bommersbach, Wolfgang; and Dean, Robert A., Jr., 4,230,012, Cl. 84-1.010.

Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M. Method of disposing of toxic substances. 4,230,053, Cl. 110-346.000.

De Atley, William B.: *See*—
Kagetsu, Tadashi J.; De Atley, William B.; Fox, Joseph S.; and Malacarne, Oreste J., 4,230,677, Cl. 423-54.000.

Deaver, Richard A.; Eifort, Ralph C.; and Nagel, John A., to NCR Corporation. Apparatus for facilitating the servicing of printed circuit boards. 4,230,986, Cl. 324-158.00F.

De Benedictis. Leonard C.: *See*—
Hug, William F.; and De Benedictis, Leonard C., 4,230,902, Cl. 178-15.000.

Debionne, Alain: *See*—
Thierry, Jean-Pierre; Debionne, Alain; and Nourry, Daniel, 4,230,388, Cl. 339-74.00R.

de Bont, Marinus R. J.; Kivits, Petrus J.; Schoot, Cornelis J.; and Zalm, Pieter, to U.S. Philips Corporation. Information-recording element having a dye-containing auxiliary layer. 4,230,939, Cl. 235-488.000.

Decca Limited: *See*—
Morgan, Scott J. C., 4,230,520, Cl. 156-505.000.

Decker, Richard H.; Ling, Chung-Mei; and Overby, Lacy R., to Abbott Laboratories. Hapten conjugated antibody for antibody or antigen detection. 4,230,683, Cl. 424-1.000.

De Clercq, Erik; and Holy, Antonin, to Stichting Rega V.Z.W.; and Ceskoslovenska Akademie Ved., part interest to each. Therapeutic application of (S) -or (RS)-9-(2, 3-dihydroxypropyl) adenine for use as antiviral agents. 4,230,708, Cl. 424-253.000.

de Cuadros, Graciela V. O. Collapsible hammock support. 4,229,845, Cl. 5-127.000.

Deere & Company: *See*—
Carolan, Donald L., 4,230,200, Cl. 180-272.000.
Schlueter, Francis E.; Copley, Russell D.; and Sanderson, Leon F., 4,229,931, Cl. 56-10.200.

Degen, Hugo, to Marpal AG. Upper mattresses. 4,229,847, Cl. 5-481.000.

Degen, Ludwig: *See*—
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,230,562, Cl. 210-610.000.

DeKlerk, Jacobus J. M. J.: *See*—
van Doorn, Cornelis Z.; and DeKlerk, Jacobus J. M. J., 4,231,035, Cl. 340-784.000.

Delaporte, Francois X.: *See*—
Azzis, Daniel; and Delaporte, Francois X., 4,231,020, Cl. 340-347.0DA.

Delcroix, Andre. Complementary elements assembleable into a partition for preexisting wall-partitions. 4,229,918, Cl. 52-242.000.

Deleens, Gerard: *See*—
Foy, Paul; Jungblut, Camille; and Deleens, Gerard, 4,230,838, Cl. 525-408.000.

Delente, Jacques J.; and Weeks, Lloyd E., to Monsanto Company. Discrete biochemical electrode system. 4,230,537, Cl. 204-1.00T.

Dellorfano, Fred M., Jr.: *See*—
Massa, Frank, 4,231,112, Cl. 367-158.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,230,627, Cl. 260-397.200.

DelVecchio, Robert M.; and Meiksin, Zvi H., to University of Pittsburgh. Discontinuous metal film resistor and strain gauges. 4,231,011, Cl. 338-2.000.

Demarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, to Societe Miniere et Metallurgique de Penarroya. Method of selectively bringing into solution the non-ferrous metals contained in sulphurized ores and concentrates. 4,230,487, Cl. 75-101.00R.

De Mesmaeker, Ivan, to BBC Brown, Boveri & Company, Limited. Process and device for short-circuit monitoring of electrical lines. 4,230,982, Cl. 324-52.000.

Denay, Andre M. J.; and Bouge, Pierre M. J., to Herve et Fils, S.A. Continuous strip of sealed envelopes with inner documents. 4,230,262, Cl. 229-69.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakagawa, Koji; and Watanabe, Yoshiteru, 4,230,499, Cl. 106-90.000.

Dennison Manufacturing Company: *See*—
Carlson, Lee A.; and Miekka, Richard G., 4,230,785, Cl. 430-56.000.

Denver Wood Products Company: *See*—
Miller, Robert M., 4,230,162, Cl. 144-3.00R.

Depin, Jean-Claude: *See*—
Briet, Philippe; Berthelon, Jean-Jacques; and Depin, Jean-Claude, 4,230,850, Cl. 544-151.000.

Derick, Burton N.; Moynihan, Robert E.; and Wolfe, Jon W., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral ink formulation. 4,230,775, Cl. 428-525.000.

Derman, Karl G., to K. G. Derman AB. Device for sealing an annular opening between a shaft and housing surrounding the shaft. 4,230,324, Cl. 277-74.000.

Desalination Systems, Inc.: *See*—
Bray, Donald T.; and Tondreau, Raymond A., 4,230,579, Cl. 210-101.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Method for producing spherical articles. 4,230,653, Cl. 264-39.000.

Desblache, Andre E., to International Business Machines Corporation. Method and device for determining the phase intercept in a system employing phase-shift keying modulation. 4,231,094, Cl. 364-514.000.

Despreaux, Carl; Narwid, Thomas A.; Palleroni, Norberto J.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Process for chenodeoxycholic acid and intermediates therefore. 4,230,625, Cl. 260-397.100.

Dettmann, Heinrich; and Mehrer, Otto, to Burkert GmbH. Control valve arrangement for dental equipment. 4,230,143, Cl. 137-270.000.

Deutsch Company Electronic Components Division, The: *See*—
Doty, John S., 4,229,876, Cl. 29-469.000.

Deutsche Automobilgesellschaft mbH: *See*—
von Benda, Klaus; and Kistrup, Holger, 4,230,778, Cl. 429-104.000.

Deutsche Gold -und Silber-Scheidearstalt vormals Roessler: *See*—
Amann, Herbert; and Morlock, Gerhard, 4,230,606, Cl. 260-6.000.

Dewey, Michael J.: *See*—
Bickley, Robert H.; and Dewey, Michael J., 4,230,973, Cl. 315-383.000.

de Wit, Erik, to Hermes Susstoff AG. Tablet dispenser. 4,230,237, Cl. 221-298.000.

Diago Meseguer, Jose: *See*—
Palomo Coll, Antonio L.; and Diago Meseguer, Jose, 4,230,849, Cl. 544-28.000.

Dial, Charles E., Sr., to United States of America, Energy. Tool grinding machine. 4,229,909, Cl. 51-165.750.

Di Amico, Paul E. Beverage can handle. 4,230,235, Cl. 220-94.00R.

Diamond International Corporation: *See*—
Kramer, Robert G., 4,230,260, Cl. 229-39.00B.

Dickinson & Bowden Associates, Inc.: *See*—
Bowden, Lloyd L.; and Dickinson, C. Burton, 4,229,863, Cl. 24-277.000.

Dickinson, C. Burton: *See*—
Bowden, Lloyd L.; and Dickinson, C. Burton, 4,229,863, Cl. 24-277.000.

Dickinson, Roger P.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,230,714, Cl. 424-263.000.

Dickson, Charles H., Sr., to United States of America, Navy. Diver's suit excess gas exhaust valve. 4,229,832, Cl. 2-2.10R.

Dietrich, Walter: *See*—
Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, 4,230,739, Cl. 427-42.000.

Digital Equipment Corporation: *See*—
Anderson, Albert L., 4,231,071, Cl. 360-40.000.
Lewine, Donald A.; Dundon, Thomas M.; and Setera, Ronald J., 4,231,089, Cl. 364-200.000.

Dil, Jan G.; and Jacobs, Bernardus A. J., to U.S. Philips Corporation. Record carrier with an optically readable radiation-reflecting information structure. 4,230,915, Cl. 179-100.10G.

Dimond, Kenneth E. Shooter board game. 4,230,318, Cl. 273-119.00R.

Director-General of National Laboratory for High Energy Physics, The: *See*—
Ishimaru, Hajime, 4,231,003, Cl. 333-33.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Yamauchi, Aizo; Matsuzawa, Yasuo; Kamiya, Sadayoshi; Nishioka, Keisuke; Hara, Yoshiaki; and Matsushima, Shogo, 4,230,690, Cl. 424-78.000.

Disselbeck, Dieter; Hilscher, Eduard; and Speier, Klaus, to Hoechst Aktiengesellschaft. Heat exchanger element. 4,230,175, Cl. 165-46.000.

Distler, Walter; and Heinzelmann, Karl-Georg, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images of a radiography subject. 4,230,949, Cl. 250-445.00T.

Diversey Corporation, The: *See*—
Elfers, Gunther H., 4,230,599, Cl. 252-321.000.

Divins, Larry A.; and Short, Larry E., to General Electric Company. Apparatus for recovering nuclear fuel from scrap material. 4,230,672, Cl. 422-159.000.

Dobbins, Donald J.: *See*—
Lenk, Erich; and Dobbins, Donald J., 4,230,285, Cl. 242-43.00R.

Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft: *See*—
Franzen, Jochen; and Weiss, Gerhard, 4,230,943, Cl. 250-281.000.

Dr. Ing. Rudolf Hell GmbH: *See*—
Wellendorf, Klaus; and Sommer, Ruediger, 4,231,069, Cl. 358-256.000.

Documation Incorporated: *See*—
Cattorini, Joseph F.; and Dandage, Subhash R., 4,229,982, Cl. 74-63.000.

Dodson, Christopher, to Commonwork Enterprises Limited. Slurry digester and capping arrangement for use therein. 4,230,580, Cl. 210-170.000.

Dodson, Robert W., to Colt Industries Operating Corp. Induction passage structure. 4,230,645, Cl. 261-19.000.

Doerschuk, Ernest E., III: *See*—
Piascinski, Joseph J.; and Doerschuk, Ernest E., III, 4,230,781, Cl. 430-5.000.

Dolikian, Arman V., to Motorola, Inc. Synchronizing means for a two-way communication system. 4,231,114, Cl. 455-49.000.

Donatelli, Paul C.; and Main, Kenneth G., to Aluminum Company of America. Control circuit arrangement for DC motors. 4,230,975, Cl. 318-6.000.

Donnert, Dietfried; and Eberle, Siegfried, to Kernforschungszentrum Karlsruhe, GmbH. Method for purifying phosphate containing waste waters. 4,230,565, Cl. 210-683.000.

Dorsch, Norman: *See*—
Sommer, Oswin; Schiller, August; Dorsch, Norman; and Strasser, Alois, 4,230,826, Cl. 525-100.000.

Dotschkal, Anton A.; and Massaro, James J., to Irvine Enterprises Inc. Heating system for building structures. 4,230,267, Cl. 236-9.00A.

Dotter, Klaus: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,230,907, Cl. 179-1.00E.

Doty, John S., to Deutsch Company Electronic Components Division, The. Optical fiber breaker and method, and combination breaker and optical connector. 4,229,876, Cl. 29-469.000.

Douglas, George H.: *See*—
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,230,727, Cl. 424-330.000.

Douglas, Terence A.: *See*—
Crowther, Gerald O.; Douglas, Terence A.; and Farmer, Howard M., 4,231,031, Cl. 340-695.000.

Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., to Ex-Cell-O Corporation. Gear reducer with tandem drives to the output. 4,229,991, Cl. 74-409.000.

Dow Corning Corporation: *See*—
Jones, James E., 4,229,976, Cl. 73-371.000.

Downs, Edgar S. Automatic gripper for caps to be removed from jars. 4,230,000, Cl. 81-3.200.

Dragerwerk Aktiengesellschaft: *See*—
Leichnitz, Kurt, 4,230,457, Cl. 23-232.00R.

Drago, Russell S.: *See*—
Gaul, John H., Jr.; and Drago, Russell S., 4,230,828, Cl. 525-153.000.

Drake, William O.; Hinsken, Hans; Mayerhoefer, Horst; and Mueller, Wolfgang H., to Sandoz Ltd. Carbonates and urethanes of 2,2'-alkylene or -cycloalkylene-bis-4,6-disubstituted phenols as stabilizers for organic materials. 4,230,857, Cl. 544-388.000.

Dring, Eric: *See*—
Bell, Roy L.; Gillard, Dennis A.; Watt, Peter; Cartledge, Brian; Millhouse, Barry; Cheese, Michael E.; and Dring, Eric, 4,230,371, Cl. 299-33.000.

Drone, Gary A.: *See*—
Carl, David F.; and Drone, Gary A., 4,230,152, Cl. 137-596.000.

Dropinski, Marion. Picture-making easel and frame. 4,229,890, Cl. 38-102.100.

Dubin, Robert R.: *See*—
Dunn, Bruce S.; and Dubin, Robert R., 4,230,256, Cl. 228-193.000.

Dubois, Jean-Claude: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,230,596, Cl. 252-299.000.

DuBrock, Leland D.: *See*—
Cobb, A. Lawrence; and DuBrock, Leland D., 4,230,521, Cl. 156-549.000.

DuBroff, Warren, to Lathrop Paulson Company. Tape applying apparatus. 4,230,519, Cl. 156-468.000.

Dubuisson, S. Elliott: *See*—
Brown, George R.; Carroll, Joseph C.; and Dubuisson, S. Elliott, 4,230,422, Cl. 405-210.000.

Dundon, Thomas M.: *See*—
Lewine, Donald A.; Dundon, Thomas M.; and Setera, Ronald J., 4,231,089, Cl. 364-200.000.

Dunk, Ronald G., to PPG Industries, Inc. Ceramic roll drive and support mechanism and a method of using same. 4,230,475, Cl. 65-118.000.

Dunn, Bruce S.; and Dubin, Robert R., to General Electric Company. Method of bonding a composite body to a metallic element. 4,230,256, Cl. 228-193.000.

Duo-Fast Corporation: *See—*
Nasiatka, John R.; Austin, Ronald; and Schaudek, Ernest F., 4,230,249, Cl. 227-123.000.

Du Pont de Nemours, E. I., and Company: *See—*
Campo, Edgar A.; and Lewis, Robert B., 4,229,861, Cl. 19-161.100.
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,230,844, Cl. 526-210.000.
Derick, Burton N.; Moynihan, Robert E.; and Wolfe, Jon W., 4,230,775, Cl. 428-525.000.
Felten, John J., 4,230,493, Cl. 106-1.130.
Gunther, Herbert; and Blank, Herbert, 4,230,796, Cl. 430-523.000.
Hill, Martin J., 4,230,790, Cl. 430-288.000.
Mahler, Walter; and Forshey, William O., Jr., 4,230,679, Cl. 423-325.000.
Phillips, Thomas R., 4,230,771, Cl. 428-437.000.
Pruckmayr, Gerfried, 4,230,892, Cl. 568-617.000.
Tanny, Stephen R.; and Blatz, Philip S., 4,230,830, Cl. 525-222.000.

Duquesne, Victor. Apparatus for fitting and removing an automobile tire. 4,230,170, Cl. 157-1.240.

Durant, Dick Q., to McDonnell Douglas Corporation. Microwave heated vacuum dryer for powders. 4,229,886, Cl. 34-92.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active triazole and thiadiazole thiourea and urea compounds. 4,230,865, Cl. 548-138.000.

E. R. Squibb & Sons, Inc.: *See—*
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., 4,230,621, Cl. 260-239.570.

Eadline, James D.: *See—*
Baxter, Stephen M.; Baxter, M. David; and Eadline, James D., 4,229,858, Cl. 17-44.000.

Eagan, John J.: *See—*
Murch, Robert M.; Meyer, Phyllis I.; and Eagan, John J., 4,230,822, Cl. 521-106.000.

Eagle, Raymond S.; and Patel, Vishnu A., to Pullman Incorporated. Radial ammonia converter. 4,230,669, Cl. 422-148.000.

Earth Sciences, Inc.: *See—*
Hartman, George J.; and Ewing, Vernon R., 4,230,678, Cl. 423-112.000.

Easley, Thomas E. Method and apparatus for opening a lock. 4,229,959, Cl. 70-394.000.

Eastman, George Y.; and Ernst, Donald M., to Thermacore, Inc. Closely coupled two phase heat exchanger. 4,230,173, Cl. 165-1.000.

Eastman Kodak Company: *See—*
Barnsbee, Clive D., 4,230,662, Cl. 264-553.000.
Fessenden, John R., 4,229,950, Cl. 64-5.000.
Hill, Doyle E., 4,230,601, Cl. 252-408.000.
Kurtz, Clark N., 4,230,405, Cl. 355-4.000.
Toner, James K., 4,230,757, Cl. 428-137.000.
Wu, Tai-Wing, 4,230,456, Cl. 23-230.00B.

Eaton Corporation: *See—*
Mueller, Robert S., 4,230,076, Cl. 123-90.160.
Worthen, Roger P.; and Walsh, Michael M., 4,230,149, Cl. 137-517.000.

Ebauches Electroniques SA: *See—*
Fatton, Jean-Claude, 4,231,090, Cl. 364-411.000.

Eberle, Siegfried: *See—*
Donnert, Dietfried; and Eberle, Siegfried, 4,230,565, Cl. 210-683.000.

Eberle, William J., to General Battery Corporation. Ladle for delivering a plurality of aliquots of molten metal. 4,230,241, Cl. 222-252.000.

Ebihara, Masatomi: *See—*
Hidaka, Tsuneo; Inoue, Masahide; and Ebihara, Masatomi, 4,230,455, Cl. 433-202.000.

Ecker, Richard E., to Vitose Corporation. Enhanced protein assimilation with fructose. 4,230,695, Cl. 424-177.000.

Eckert, Konrad: *See—*
Wessel, Wolf; and Eckert, Konrad, 4,230,083, Cl. 123-450.000.

Eckert, Theodor; and Kemper, Fritz H., to Kali-Chemie Pharma GmbH. Readily enterally absorbable pharmaceutical compositions of per se poorly enterally absorbable pharmacologically active agents. 4,230,702, Cl. 424-242.000.

Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Boring tool for making borings in solid metal material of workpieces. 4,230,429, Cl. 408-186.000.

Edholm, Emil. Collapsible wheel-chair undercarriage. 4,230,339, Cl. 280-647.000.

Edstrom, Soren E. H., to Kockums Industri Aktiebolag. Antifriction bearing construction. 4,230,379, Cl. 308-187.000.

Eggermont, Ludwig D. J., to U.S. Philips Corporation. Arrangement for filtering compressed pulse-code-modulated signals. 4,231,100, Cl. 364-724.000.

Eggermont, Ludwig D. J., to U.S. Philips Corporation. Digital filter arrangement for non-uniformly quantized PCM. 4,231,101, Cl. 364-724.000.

Ehmann, Willy: *See—*
Aniszewski, Bodo; and Ehmann, Willy, 4,230,133, Cl. 132-40.000.

Ehrenthal, Irving; Slapshak, Louis F.; and Rajpara, Jagdish, to Anheuser-Busch, Incorporated. Unrefined glucose syrup as substrate by glucose isomerizing enzyme in producing fructose from glucose. 4,230,802, Cl. 435-94.000.

Eichhorn, Wilfried; and Seibel, Peter, to Hoechst Aktiengesellschaft. Process for the manufacture of a vinyl ester copolymer. 4,230,643, Cl. 525-253.000.

Eickmann, Karl. Fluid-stream driven ground vehicle. 4,230,198, Cl. 180-7.00P.

Eifort, Ralph C.: *See—*
Deaver, Richard A.; Eifort, Ralph C.; and Nagel, John A., 4,230,986, Cl. 324-158.00F.

Eisenman, Leonard J. Bulk material bed. 4,230,360, Cl. 296-181.000.

Ekbladh, Fred V. G., to Astra-Sjuco AB. Device for the training of a urine bladder. 4,230,102, Cl. 128-79.000.

Electronic Associates, Inc.: *See—*
Muldoon, James F., 4,229,968, Cl. 73-23.100.

Elektroschmelzwerk Kempten GmbH: *See—*
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Elfab Corporation: *See—*
Ammon, J. Preston; and Weaver, Harry R., 4,230,385, Cl. 339-17.00R.

Elfers, Gunther H., to Diversey Corporation, The. Process for inhibiting foaming utilizing maleic ester copolymer based defoamers, and defoamed compositions. 4,230,599, Cl. 252-321.000.

Eli Lilly and Company: *See—*
Chou, Ta S., 4,230,620, Cl. 260-239.100.
Hatfield, Lowell D.; Blaszczak, Larry C.; and Fisher, Jack W., 4,230,644, Cl. 260-960.000.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,230,861, Cl. 546-164.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,230,868, Cl. 548-306.000.
Suarez, Tulio; and Jones, C. David, 4,230,862, Cl. 546-237.000.

Eli Lilly Industries Limited: *See—*
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,716, Cl. 424-273.00R.

Eli Sandman Company: *See—*
Sandman, Michael A.; and Loughlin, Bernard T., 4,230,461, Cl. 51-295.000.

Elings, Virgil B. Apparatus and method for measuring extravascular lung water. 4,230,126, Cl. 128-671.000.

Elliot, Charles T.: *See—*
Day, Derek J.; and Elliot, Charles T., 4,231,052, Cl. 357-24.000.

Ellis Paperboard Products, Inc.: *See—*
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Eltgen, Jean-Jacques: *See—*
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Eltra Corporation: *See—*
Brothers, Gene A.; Neely, John A.; and Kieffe, Patrick W., 4,230,913, Cl. 179-18.0FC.
Hansen, Walter I.; Galbraith, Wiley E.; Vella, Louis C.; and Cohen, Martin M., 4,231,096, Cl. 364-523.000.
Varma, Brajendra P., 4,230,779, Cl. 429-204.000.

Emhart Industries, Inc.: *See—*
Klein, Gerhart P., 4,230,742, Cl. 427-79.000.

Emmel, Leroy L. Elongated filament lattice structure. 4,230,898, Cl. 174-32.000.

Emmett, John C.: *See—*
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Emori, Takeo: *See—*
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.

Enders, George E., to NRM Corporation. Modular tire building machine. 4,230,517, Cl. 156-396.000.

Endo, Fujio: *See—*
Takayama, Toshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,230,800, Cl. 435-101.000.

Engineered Systems, Inc.: *See—*
Buehrle, William B., 4,230,989, Cl. 375-4.000.

English, Edgar, Jr. Water-saving float-to-inlet valve adapter device. 4,229,846, Cl. 4-396.000.

Enright, John J.; and Holzworth, William T., to B. F. Goodrich Company, The. Method of making a caliper brake rotor. 4,230,253, Cl. 228-152.000.

Eppler, Richard. Device to support rudders and trailing edge flaps of aircraft and watercraft. 4,230,295, Cl. 244-213.000.

Ernst, Donald M.: *See—*
Eastman, George Y.; and Ernst, Donald M., 4,230,173, Cl. 165-1.000.

Eshleman, James M.: *See—*
Connolly, Arlene D.; Eshleman, James M.; and Knaub, Edgar W., 4,230,605, Cl. 252-545.000.

Espelage, Paul M.; Walker, Loren H.; and Wright, William G., deceased (by Wright, Mary Nobel, executrix), to General Electric Company. Controlled current inverter and motor control system. 4,230,979, Cl. 318-721.000.

Ethyl Corporation: *See—*
Cribben, James T.; and Feeser, Richard A., 4,229,844, Cl. 52-588.000.

Eubank, Marcus P. Damper assembly. 4,230,174, Cl. 165-27.000.

European Atomic Energy Community: *See—*
Krueger, Gottfried J., 4,231,008, Cl. 335-209.000.

Eutectic Corporation: *See—*
Patel, Mahesh S., 4,230,747, Cl. 427-423.000.
Patel, Mahesh S., 4,230,748, Cl. 427-423.000.
Patel, Mahesh S., 4,230,749, Cl. 427-423.000.

Yurasko, George, Jr., 4,230,750, Cl. 427-423.000.
Euwema, George J.; and Euwema, George W. Child's table seat. 4,230,362, Cl. 297-174.000.
Euwema, George W.: *See*—
Euwema, George J.; and Euwema, George W., 4,230,362, Cl. 297-174.000.
Evans, Sheldon, to Hoogovens Ijmuiden, B.V. Method for regenerating a weak base anion exchanger. 4,230,807, Cl. 521-26.000.
Every, William A.: *See*—
Paspek, Stephen C.; and Every, William A., 4,230,888, Cl. 562-600.000.
EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern GmbH & Co.: *See*—
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Ewing, Vernon R.: *See*—
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Ex-Cell-O Corporation: *See*—
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.
Exxon Research & Engineering Co.: *See*—
Brois, Stanley J.; and Ver Strate, Gary, 4,230,837, Cl. 525-343.000.
Ilnyckyj, Stephen, 4,230,811, Cl. 526-227.000.
Fabian, Wolfgang: *See*—
Gall, Ludwig; and Fabian, Wolfgang, 4,230,858, Cl. 546-37.000.
Fagan, James D. Flora attaching device. 4,229,877, Cl. 29-509.000.
Fahnrich, Adolf, to Hermann Kronseder. Device for fixing foils on bottles standing upright. 4,230,518, Cl. 156-456.000.
Fairchild Camera and Instrument Corporation: *See*—
Matrone, John L.; and Roberts, Robert D., 4,230,985, Cl. 324-158.00F.
Schneider, Mark R.; and Wickwar, Larry D., 4,229,936, Cl. 368-282.000.
Stinehelfer, Jonathan J., 4,231,110, Cl. 365-194.000.
Fairchild Industries, Inc.: *See*—
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Faisst, Dieter: *See*—
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Falcione, Ronald J.; McManis, Ronald R.; and Aufman, Joseph A., to Calgon Corporation. Polyacrylate pigment dispersants for magnesium oxide. 4,230,610, Cl. 260-29.60M.
Falcone, James S., Jr.; and Spencer, Robert W., to PQ Corporation. Zinc rich paint vehicle. 4,230,496, Cl. 106-14.210.
Falk, Helmut: *See*—
Hebert, Donald G., 4,230,038, Cl. 101-93.050.
Hebert, Donald G., 4,230,412, Cl. 400-124.000.
Faltin, Hans G. Storage pallet arrangements for folded paper items. 4,230,311, Cl. 271-3.100.
Fanning, William J., to Western Electric Company, Incorporated. Machine for laser scribing and winding metallized film capacitor blanks. 4,229,865, Cl. 29-25.420.
Farmer, Howard M.: *See*—
Crowther, Gerald O.; Douglas, Terence A.; and Farmer, Howard M., 4,231,031, Cl. 340-695.000.
Farmhand (U.K.) Limited: *See*—
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Farmitalia Carlo Erba S.p.A.: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, 4,230,619, Cl. 260-239.00A.
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,230,721, Cl. 424-285.000.
Farnworth, Ivan A.; and Farnworth, Ivan R. Self locking safety socket. 4,230,386, Cl. 339-42.000.
Farnworth, Ivan R.: *See*—
Farnworth, Ivan A.; and Farnworth, Ivan R., 4,230,386, Cl. 339-42.000.
Farris, Robert E.: *See*—
Allen, Jim E.; and Farris, Robert E., 4,230,652, Cl. 264-30.000.
Fatton, Jean-Claude, to Ebauches Electroniques SA. Electronic game of adroitness incorporated in an electronic watch. 4,231,090, Cl. 364-411.000.
Faudree, Thomas L., III, to Petrozorbent Corporation. Foamaceous hydrocarbon adsorption medium and method and system for making same. 4,230,566, Cl. 210-693.000.
Fauke, Allen R.: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,230,839, Cl. 526-75.000.
Faustini, Franco: *See*—
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Fauth, Gunter: *See*—
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Fearon, Joseph G., to Morrison-Knudsen Company, Inc. Method and system for increasing the track-to-wheel friction of the wheels of a locomotive for motive power and decreasing the rolling resistance for trailing loads. 4,230,045, Cl. 104-279.000.
Feather, Jack V. Exercise pants. 4,230,114, Cl. 128-293.000.
Fedeli, Gianfranco: *See*—
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Feeser, Richard A.: *See*—
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Felix, Raymond A., to Stauffer Chemical Company. Substituted cyclopropylmethoxy phenyl carbamates and thiocarbamates and their use as herbicides. 4,230,483, Cl. 71-100.000.
Fellinger, Frank; and Ruffing, James M., to International Telephone and Telegraph Corporation. Carrier terminal unit. 4,230,911, Cl. 370-84.000.
Felper, Gerald A.: *See*—
Gerhard, Francis H.; and Felper, Gerald A., 4,230,971, Cl. 315-307.000.
Felten, John J., to Du Pont de Nemours, E. I., and Company. Gold conductor compositions. 4,230,493, Cl. 106-1.130.
Fernandopulle, Placidus D. Wind powered solar still. 4,230,531, Cl. 202-180.000.
Ferrari, Domenic C.: *See*—
Sheely, Harold R.; Oricchio, F. Frederick; and Ferrari, Domenic C., 4,230,668, Cl. 422-140.000.
Ferro Manufacturing Corporation: *See*—
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Fessenden, John R., to Eastman Kodak Company. Coupling for end gudgeon and internally heated roller. 4,229,950, Cl. 64-5.000.
Fiat-Allis Construction Machinery, Inc.: *See*—
Carl, David F.; and Drone, Gary A., 4,230,152, Cl. 137-596.000.
Fichtel & Sachs A.G.: *See*—
Schwerdhofer, Hans-Joachim, 4,229,997, Cl. 74-752.00E.
Figge, Irving E.; and Dean, Edward H., to United States of America, Army. Prestressed article. 4,230,764, Cl. 428-268.000.
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., to FMC Corporation. Peroxygen bleaching and compositions therefor. 4,230,591, Cl. 252-102.000.
Finnegan, Robert J., to Barreca Products Co., Inc. Ski rack. 4,230,248, Cl. 224-323.000.
Firestone Tire & Rubber Company, The: *See*—
Bohm, George G. A.; and Gross, Stanley S., 4,230,649, Cl. 264-22.000.
Fischer, Frederick R.: *See*—
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Fisher, Jack W.: *See*—
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Fisher, Robert E., to Acroform Corporation. Camp lantern. 4,230,446, Cl. 431-123.000.
Fisher, William F.; Thompson, Malcolm J.; Wright, Fred C.; and Robbins, William E., to United States of America, Agriculture. Control of parasitic mites with alkyl amines. 4,230,726, Cl. 424-325.000.
Fitch, Robert C.; and Narendra, Patrenahalli M., to Honeywell Inc. Local area contrast enhancement device. 4,231,065, Cl. 358-166.000.
Fitzgibbons, Michael R.: *See*—
Seto, Rodney K. M.; Brickman, Eugene L.; and Fitzgibbons, Michael R., 4,230,187, Cl. 166-362.000.
Flajnik, Louis, to Continental Group, Inc., The. Plural cable container conveyor and turn therefor. 4,230,223, Cl. 198-817.000.
Flatt, Adrian E.: *See*—
Youm, Youngil; and Flatt, Adrian E., 4,229,841, Cl. 3-1.910.
Fleischman, Andor A., to Bell & Howell Company. Large aperture extended range zoom lens. 4,230,397, Cl. 350-184.000.
Flinsenberg, Christiaan F. W.: *See*—
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,230,788, Cl. 430-153.000.
Flowers, David E.: *See*—
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Flowers, Gene D.; and Flowers, David E. Fishing hook with encircling holder for live bait. 4,229,901, Cl. 43-44.400.
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Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,230,591, Cl. 252-102.000.
Persoons, Gustaaf M.; and Wijts, Corneel C., 4,229,932, Cl. 56-13.500.
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Synthetic routes to azetidinones related to nocardicin. 4,230,619, Cl. 260-239.00A.
Fohl, Artur, to Kepa Feinstanzwerk GmbH. Re-tightener with pyrotechnic propellant charge for safety-belt automatic wind-up devices. 4,230,288, Cl. 242-107.000.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Automatic wind-up roller for safety belts. 4,230,289, Cl. 242-107.40A.
Fokker-VFW BV: *See*—
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Ford Motor Company: *See*—
Chang, Uck I.; and Casey, Kenneth W., 4,230,930, Cl. 219-121.0LD.
Hildebrand, Daniel H., 4,229,996, Cl. 74-688.000.
Moskowitz, David, 4,230,462, Cl. 51-307.000.
Rao, Vemulapalli D. N., 4,230,651, Cl. 264-29.700.
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Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., 4,230,514, Cl. 156-305.000.
Fornasiero, Peter J. Releasable boat anchor. 4,230,062, Cl. 114-297.000.

Fornwalt, Robert G.; and Shatto, Walter C., Jr., to AMP Incorporated. Cable splitter. 4,230,008, Cl. 83-456.000.
Forsberg, John R., to Helene Curtis Industries, Inc. Hair dryer attachment. 4,230,279, Cl. 239-559.000.
Forseth, Glenn J., to Phillips Petroleum Company. Carbon black producing apparatus and method. 4,230,670, Cl. 422-151.000.
Forshey, William O., Jr.: *See*—
Mahler, Walter; and Forshey, William O., Jr., 4,230,679, Cl. 423-325.000.
Forss, John A.; and Lee, Tzuo-Chang, to Honeywell Inc. Electro-optic smoke detector. 4,230,950, Cl. 250-574.000.
Forstrom, Richard J.; and Wardle, Michael D., to Moore-Perk Corporation. Cold gas sterilization process using hydrogen peroxide at low concentrations. 4,230,663, Cl. 422-33.000.
Fox, Joseph S.: *See*—
Kagetsu, Tadashi J.; De Atley, William B.; Fox, Joseph S.; and Malacarne, Oreste J., 4,230,677, Cl. 423-54.000.
Fox, Richard: *See*—
Bailey, John R. W.; Carter, Michael R. L.; and Fox, Richard, 4,230,041, Cl. 102-27.00R.
Foy, Paul; Jungblut, Camille; and Deleens, Gerard, to ATO Chimie. Mouldable and extrudable polyether-ester-amide block copolymers. 4,230,838, Cl. 525-408.000.
Foy, Philip W.: *See*—
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., 4,231,050, Cl. 357-16.000.
France Bed Co., Ltd.: *See*—
Morita, Masayasu, 4,229,983, Cl. 74-89.140.
Franceschi, Giovanni: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, 4,230,619, Cl. 260-239.00A.
Francese, Renato: *See*—
Messori, Vittorio; and Francese, Renato, 4,230,853, Cl. 544-204.000.
Francis, Marion D., to Procter & Gamble Company, The. Methods for inhibiting mobilization of calcium phosphate in animal tissue. 4,230,700, Cl. 424-204.000.
Frank R. Lount & Son (1971) Ltd.: *See*—
Lount, William D., 4,229,920, Cl. 52-309.120.
Frantz, Virgil L., to Graham-White Sales Corporation. Solenoid-actuated valve. 4,230,156, Cl. 137-625.500.
Franzen, Jochen; and Weiss, Gerhard, to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft. Mass spectrometer. 4,230,943, Cl. 250-281.000.
Freberg, Dana D.: *See*—
Smith, Joseph P., Jr.; Mentzer, Robert L.; and Freberg, Dana D., 4,230,439, Cl. 415-138.000.
Fredd, John V., to Otis Engineering Corporation. Rod operated rotary well valve. 4,230,185, Cl. 166-332.000.
Frederiksen, Per D.: *See*—
Larsen, Christian; Frederiksen, Per D.; and Sorensen, Ebbe N., 4,230,157, Cl. 138-155.000.
Freeman, Samuel. Instant color slide recorder of CRT image. 4,231,061, Cl. 358-76.000.
Freeman, William H.; and Golden, David C., to Freeman, William H. Vehicle brake light illumination system. 4,231,013, Cl. 340-72.000.
Frensch, Heinz: *See*—
Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, 4,230,809, Cl. 521-65.000.
Frey, Egon: *See*—
Gmeiner, Gunter; Frey, Egon; and Berger, Josef, 4,229,853, Cl. 15-250.160.
Fried. Krupp Huttenwerke AG: *See*—
Heller, Wilhelm; Knoor, Walter; and Schweitzer, Reinhard, 4,230,488, Cl. 75-123.00F.
Fritzlen, Jack D.; and Witler, James L., to Glymar. Radar speedometer. 4,231,039, Cl. 343-8.000.
Fryd, Michael: *See*—
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,230,844, Cl. 526-210.000.
Frye, Joe G., Sr.; and Frye, Teresa J. Timed on-off sequence shower valve. 4,230,155, Cl. 137-624.220.
Frye, Teresa J.: *See*—
Frye, Joe G., Sr.; and Frye, Teresa J., 4,230,155, Cl. 137-624.220.
Fuchs, Peter: *See*—
Schopflin, Gisela; Fuchs, Peter; and Kolb, Karl H., 4,230,686, Cl. 424-22.000.
Fuji Photo Film Co., Ltd.: *See*—
Nakamura, Hiroaki; Kaneko, Shiro; and Watanabe, Takeshi, 4,230,743, Cl. 427-146.000.
Fujie, Shigo: *See*—
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.
Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Tsujii, Yasuhiro; and Shigehara, Itaru, 4,230,642, Cl. 570-193.000.
Fujikura Cable Works, Ltd.: *See*—
Saruwatari, Kohichi; Isawa, Kazuo; Maejima, Masatsugu; and Suzuki, Takao, 4,230,539, Cl. 204-35.00N.
Fujimoto, Hideaki, to Shimano Industrial Company, Limited. Bicycle derailleur having positive speed position retention. 4,229,987, Cl. 474-82.000.
Fujita, Hironori: *See*—
Komatsu, Noboru; Arai, Tohru; and Fujita, Hironori, 4,230,751, Cl. 427-443.100.
Fujitsu Limited: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, 4,231,057, Cl. 357-50.000.
Ono, Chikai; and Toyoda, Kazuhiro, 4,231,109, Cl. 365-174.000.
Sano, Yoshiaki; Hanazawa, Toshio; and Honda, Hideo, 4,230,980, Cl. 323-19.000.
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.
Fujiwara, Yukinari: *See*—
Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, 4,231,116, Cl. 455-87.000.
Fujiyoshi, Kazuyoshi; and Murakami, Kyoji, to Matsushita Electric Industrial Co., Ltd. Signal control circuit. 4,230,904, Cl. 179-1.0HF.
Fukuda, Takeo; and Kawabata, Kazuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transmission system. 4,230,903, Cl. 370-24.000.
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited; and Kao Soap Company, Limited. Antiviral agent. 4,230,725, Cl. 424-325.000.
Fukumitsu, Hirotaka: *See*—
Yoneda, Koji; Ohashi, Takehisa; Nagamachi, Tomoaki; Fukumitsu, Hirotaka; and Takahashi, Satomi, 4,230,869, Cl. 548-314.000.
Fulmer, Ray M.: *See*—
Cunningham, Cecil R.; Fulmer, Ray M.; and Cherry, Gordon E., 4,230,284, Cl. 242-18.00G.
Fulwyler, Mack J., to Coulter Electronics, Inc. Single drop separator. 4,230,558, Cl. 209-3.100.
Fumagalli, Angelo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,230,721, Cl. 424-285.000.
Funakoshi, Satoshi: *See*—
Nishida, Masayuki; Funakoshi, Satoshi; Ogasa, Katsuhiro; Kuboyama, Morio; Yanai, Nobuya; and Yamada, Muneo, 4,230,697, Cl. 424-177.000.
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Watanabe, Tadaharu; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,230,703, Cl. 424-244.000.
Furuya, Nobuo: *See*—
Itoh, Tsutomu; Ouchi, Kenji; Furuya, Nobuo; and Shimizu, Takeo, 4,230,068, Cl. 118-634.000.
Fussi, Fernando; and Fedeli, Gianfranco, to Hepar Chimie S.A. Hexuronyl hexosaminoglycane sulfate and related therapeutical uses. 4,230,699, Cl. 424-181.000.
G. D. Searle & Co.: *See*—
Chorvat, Robert J., 4,230,626, Cl. 260-397.200.
Gacon, Jean-Claude: *See*—
Vedrine, Alain; Gacon, Jean-Claude; Boulon, Georges; and Trottier, Danielle, 4,230,598, Cl. 252-301.40H.
GAF Corporation: *See*—
Nahta, Roop C., 4,230,746, Cl. 427-373.000.
Gagliardi Bros., Inc.: *See*—
Gagliardi, Eugene D., Jr.; and Gagliardi, Nicholas C., 4,229,859, Cl. 17-45.000.
Gagliardi, Eugene D., Jr.; and Gagliardi, Nicholas C., to Gagliardi Bros., Inc. Meat patty processing method and apparatus. 4,229,859, Cl. 17-45.000.
Gagliardi, Nicholas C.: *See*—
Gagliardi, Eugene D., Jr.; and Gagliardi, Nicholas C., 4,229,859, Cl. 17-45.000.
Gajda, Joseph J., to International Business Machines Corporation. Etchant for silicon dioxide films disposed atop silicon or metallic silicides. 4,230,523, Cl. 156-657.000.
Gal, George, to Merck & Co., Inc. 1,1-Di(4-hydroxy-3-methoxyphenyl)-2-alkoxypropane. 4,230,893, Cl. 568-640.000.
Galbraith, Wiley E.: *See*—
Hansen, Walter I.; Galbraith, Wiley E.; Vella, Louis C.; and Cohen, Martin M., 4,231,096, Cl. 364-523.000.
Gale, John T. Moisture removal assembly. 4,230,208, Cl. 188-73.100.
Gall, Ludwig; and Fabian, Wolfgang, to BASF Aktiengesellschaft. Perylene-3,4,9,10-tetracarboxylic acid diimide pigment, its manufacture and its use. 4,230,858, Cl. 546-37.000.
Gallagher, William A. Rotary internal combustion engine. 4,229,938, Cl. 60-39.340.
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., to Farmitalia Carlo Erba S.p.A. Bicyclic prostaglandins. 4,230,721, Cl. 424-285.000.
Gandon, Louis: *See*—
Demarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,230,487, Cl. 75-101.00R.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,230,865, Cl. 548-138.000.
Gardella, John F., Jr.; King, George W.; Kolm, Eric A.; and Kolm, Henry H., to Compugraphic Corporation. Impulse drive system. 4,230,978, Cl. 318-687.000.
Garrett Corporation, The: *See*—
Kretzinger, Karl F., 4,229,868, Cl. 29-157.30R.
Van Nimwegen, Robert R., 4,230,292, Cl. 244-23.00D.
Gartner, Jurgen, to J. S. Staedtler. Mechanical pencil having collet guide. 4,230,413, Cl. 401-65.000.

Gatt, Michael E.: *See*—
Meyer, Donald E.; Colpaert, James J.; Fischer, Frederick R.; Gatt, Michael E.; and Koehler, David P., 4,230,252, Cl. 228-152.000.

Gatto, Donald F., to Motorola, Inc. Battery holder with integral access door and power switch. 4,230,777, Cl. 429-97.000.

Gaughan, Edmund J.: *See*—
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,230,874, Cl. 560-12.000.

Gaul, John H., Jr.; and Drago, Russell S., to University of Illinois Foundation, The. Polymer bound multidentate complexes. 4,230,828, Cl. 525-153.000.

Gaumond, William J. Electric discharge machine with mechanism for orbiting the electrode. 4,230,926, Cl. 219-69.00V.

Gaussens, Gilbert; Lemaire, Francis; and Van Nguyen, Bach, to Commissariat a l'Energie Atomique. Fiber-base composite material having high tensile strength. 4,230,766, Cl. 428-288.000.

Gauthier, Donald R., to ICI United States, Inc. Azo dyestuffs containing an amino or acylated amino naphthol di-sulfonic acid radical and at least one reactive phosphoric or phosphonic acid group. 4,230,618, Cl. 260-187.000.

Gee, James W.; and Arntz, Richard J., to Magic Chef, Inc. Oven door latch. 4,230,350, Cl. 292-144.000.

Geeslin, John W.; and Spector, George. Articulated snorkel. 4,230,106, Cl. 128-201.110.

Geiss, Alan. Apparatus for securing couplings of intravenous and intra-arterial access systems. 4,230,109, Cl. 128-214.00R.

General Atomic Company: *See*—
Porter, John T., II, 4,230,547, Cl. 204-157.10R.
Union, Donald C., 4,231,015, Cl. 340-147.00R.

General Aviation Electronics, Inc.: *See*—
Henderson, Claude L.; and Abner, Edmund L., 4,231,115, Cl. 455-73.000.

General Battery Corporation: *See*—
Eberle, William J., 4,230,241, Cl. 222-252.000.

General Electric Company: *See*—
Chu, Hing C.; and Sun, Y. S. Edmund, 4,230,791, Cl. 430-296.000.
Crivello, James V., 4,230,814, Cl. 526-333.000.
Cusano, Dominic A.; and Prener, Jerome S., 4,230,510, Cl. 156-67.000.
Davison, Samuel H., 4,230,436, Cl. 415-1.000.
Divins, Larry A.; and Short, Larry E., 4,230,672, Cl. 422-159.000.
Dunn, Bruce S.; and Dubin, Robert R., 4,230,256, Cl. 228-193.000.
Espelage, Paul M.; Walker, Loren H.; and Wright, William G., deceased, 4,230,979, Cl. 318-721.000.
Goossens, John C., 4,230,769, Cl. 428-412.000.
Griffin, James R.; and Schreck, Raymond M., 4,229,945, Cl. 62-229.000.
Mark, Victor; and Wilson, Phillip S., 4,230,611, Cl. 260-29.15B.
McNutt, William J.; and Wilson, James R., 4,231,074, Cl. 361-44.000.
Schultz, William J.; and Van Bennekom, Carl F., 4,229,874, Cl. 29-432.000.
Smith, Joseph P., Jr.; Mentzer, Robert L.; and Freberg, Dana D., 4,230,439, Cl. 415-138.000.
Wendt, Michael E.; and Kushner, Gerald J., 4,229,869, Cl. 29-157.400.

General Mills, Inc.: *See*—
Brastad, William A.; and Beall, Nelson J., 4,230,924, Cl. 219-10.55E.

General Motors Corporation: *See*—
Graeser, Joseph H., Jr.; and Adkins, Robert J., 4,231,041, Cl. 343-767.000.
Leonard, Robert D., Jr.; and Nestor, Charles R., 4,230,392, Cl. 339-117.00R.
Motz, Phillip R., 4,231,091, Cl. 364-431.000.
Peeples, Denny L., 4,230,018, Cl. 91-6.000.
Schroeder, Thaddeus; and Traub, Norman L., 4,230,918, Cl. 200-61.620.
Taylor, David W., 4,230,984, Cl. 324-115.000.

General Staple Company, Inc.: *See*—
Zahn, Irwin, 4,230,387, Cl. 339-59.00M.

Geng, Hellmuth R.: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.

Genson, Charles W., to Libbey-Owens-Ford Company. Method of and apparatus for applying solder to metallic blanks. 4,230,257, Cl. 228-244.000.

Gentile, Laurentino: *See*—
Capaccioni, Mario; Gentile, Laurentino; and Rusconi, Aldo, 4,230,855, Cl. 544-348.000.

Georgeaux, Andre: *See*—
Demarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,230,487, Cl. 75-101.00R.

Georgia-Pacific Corporation: *See*—
Bornstein, L. F., 4,230,600, Cl. 252-364.000.

Gerhard, Francis H.; and Felper, Gerald A., to Datapower, Inc. Variable intensity control apparatus for operating a gas discharge lamp. 4,230,971, Cl. 315-307.000.

GF Business Equipment, Inc.: *See*—
Textoris, Melvin A.; and Holman, Thomas L., 4,229,917, Cl. 52-239.000.

Ghizzoni, Angiolino, to Aquascooter, Inc. Carburetor device. 4,230,646, Cl. 261-35.000.

Gianotti, Giuseppe: *See*—
Chiolle, Antonio; Gianotti, Giuseppe; and Parrini, Gianfranco, 4,230,583, Cl. 210-490.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Restricted slot nail openings for sheet metal framing connectors. 4,230,416, Cl. 403-232.100.

Gillard, Dennis A.: *See*—
Bell, Roy L.; Gillard, Dennis A.; Watt, Peter; Cartledge, Brian; Millhouse, Barry; Cheese, Michael E.; and Dring, Eric, 4,230,371, Cl. 299-33.000.

Gilmore, Louis. Shower curtain convertible support adapter. 4,229,842, Cl. 4-610.000.

Girling Limited: *See*—
Brearley, Malcolm; and White, Alfred K., 4,230,376, Cl. 303-106.000.

Giroux, Victor A., to Phillips Petroleum Company. Fractionation method and apparatus. 4,230,533, Cl. 203-1.000.

Glacier Metal Company, Limited, The: *See*—
Beazley, Rodney T., 4,230,581, Cl. 210-261.000.

Glaenzer Spicer: *See*—
Orain, Michel A., 4,229,871, Cl. 29-407.000.

Glanz, Kenneth D.: *See*—
Becker, William J.; Glanz, Kenneth D.; Foris, Peter L.; Brown, Robert W.; and Anderson, Jerrold L., 4,230,514, Cl. 156-305.000.

Glassmeyer, John J., to Pullman Incorporated. Telescoping drawbar for tandem tractor trailers. 4,230,335, Cl. 280-423.00A.

Glaxo Laboratories Limited: *See*—
Cherry, Peter C.; Gregory, Gordon I.; and Ward, Peter, 4,230,622, Cl. 260-245.300.

Gleason, K. Reed, to United States of America, Navy. Tungsten-titanium-chromium/gold semiconductor metallization. 4,231,058, Cl. 357-67.000.

Glen Manufacturing Company: *See*—
Steinbach, Irving H., 4,230,055, Cl. 112-239.000.

Gloucester Engineering Co., Inc.: *See*—
Schott, Charles M., Jr., 4,230,029, Cl. 93-33.00H.

Glucksman, Dov Z.; and Weidemann, Karl H., to Glucksman, Dov Z. Electric air heating element. 4,230,933, Cl. 219-375.000.

Glymar: *See*—
Fritzlen, Jack D.; and Witler, James L., 4,231,039, Cl. 343-8.000.

Gmeiner, Gunter; Frey, Egon; and Berger, Josef, to Daimler-Benz Aktiengesellschaft. Windshield wiper installation for motor vehicles. 4,229,853, Cl. 15-250.160.

Gobel, Klaus. Roof drain. 4,230,346, Cl. 285-42.000.

Godfried, Leo M., to Fokker-VFW BV. Fire-protecting polyester resins. 4,230,616, Cl. 260-40.00R.

Goebels, Hermann J., to Robert Bosch GmbH. Pressure control valve unit. 4,230,377, Cl. 303-118.000.

Goffe, William L., to Xerox Corporation. Migration imaging system with meniscus development. 4,230,782, Cl. 430-41.000.

Gold, Jack. Back brace. 4,230,101, Cl. 128-78.000.

Golden, David C.: *See*—
Freeman, William H.; and Golden, David C., 4,231,013, Cl. 340-72.000.

Gombar, Oscar J.: *See*—
Howard, James; and Gombar, Oscar J., 4,230,501, Cl. 106-308.00Q.

Gomberg, Henry J.; Lewis, John G.; and Powers, John E., to KMS Fusion, Inc. Radiolytic dissociative gas power conversion cycles. 4,229,942, Cl. 60-644.000.

Goodyear Tire & Rubber Company, The: *See*—
Broughton, Roy M., Jr.; Callander, Douglas D.; Pengilly, Brian W.; Schirmer, Joseph P.; and Winters, Terence E., 4,230,818, Cl. 528-272.000.
Bullard, Herbert L.; and Osborn, Robert A., 4,230,842, Cl. 526-185.000.
Burkholder, Ward J., 4,230,890, Cl. 568-576.000.
Burroway, Gary L.; and Maximovich, Michael J., 4,230,609, Cl. 260-29.6TA.
Hauenstein, Jack D.; and Broderick, Thomas E., 4,230,819, Cl. 528-483.000.
Lattime, Richard R., 4,230,810, Cl. 526-224.000.
Olsen, Richard J., 4,230,511, Cl. 156-123.00R.
Prudence, Robert T., 4,230,841, Cl. 526-179.000.
Roennau, Raymond B.; Chung, Daniel A.; and Jasani, Shirish, 4,230,770, Cl. 428-424.400.
Watts, William A.; and Creekmore, Mark D., 4,230,607, Cl. 260-23.0XA.
Watts, William A., 4,230,761, Cl. 428-215.000.
Watts, William A.; and Creekmore, Mark D., 4,230,774, Cl. 428-518.000.

Goossens, John C., to General Electric Company. Glass-polycarbonate laminate. 4,230,769, Cl. 428-412.000.

Gordon Barlow Design: *See*—
Barlow, Gordon A.; and Krutsch, John R., 4,230,314, Cl. 273-1.00E.

Gordon, Robert; Weingart, Oscar; King, Harry A.; and Springrose, James V., to Structural Composite Industries, Inc.; and Cargill Incorporated. Railroad car. 4,230,048, Cl. 105-248.000.

Gorman, Ralph E.; and Bruce, Robert W. Forced air fireplace furnace. 4,230,268, Cl. 237-51.000.

Goto, Hiromi; and Kagata, Tooru, to Aisin Seiki Kabushiki Kaisha. Free wheel hub apparatus for vehicles. 4,230,211, Cl. 192-35.000.

Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, to Honda Giken Kogyo Kabushiki Kaisha. Engine starting device. 4,230,084, Cl. 123-179.00S.

Graeser, Joseph H., Jr.; and Adkins, Robert J., to General Motors Corporation. Electrically conducting lead termination apparatus for a thin film antenna. 4,231,041, Cl. 343-767.000.

Graffin, Jean-Jacques, to Serac S.A. Automatic control method and device for a container filling apparatus. 4,230,195, Cl. 177-1.000.

Grafton, David A.: *See*—
Brueggemann, Harry P.; and Grafton, David A., 4,230,394, Cl. 350-6.800.

Graham-White Sales Corporation: *See*—
Frantz, Virgil L., 4,230,156, Cl. 137-625.500.

Graves, William P.: *See*—
Clark, Donald L.; and Graves, William P., 4,231,021, Cl. 340-347.0DD.

Green Cross Corporation, The: *See*—
Nishida, Masayuki; Funakoshi, Satoshi; Ogasa, Katsuhiro; Kuboyama, Morio; Yanai, Nobuya; and Yamada, Muneo, 4,230,697, Cl. 424-177.000.

Greenwood, John C., to International Standard Electric Corporation. Transducer and method of making the same. 4,229,979, Cl. 73-704.000.

Gregory, Gordon I.: *See*—
Cherry, Peter C.; Gregory, Gordon I.; and Ward, Peter, 4,230,622, Cl. 260-245.300.

Grichnik, James A.: *See*—
Wiegman, Douglas C.; and Grichnik, James A., 4,230,944, Cl. 250-355.000.

Griffin, James R.; and Schreck, Raymond M., to General Electric Company. Household refrigerator air flow control and method. 4,229,945, Cl. 62-229.000.

Griffith Laboratories U.S.A., Inc.: *See*—
Sair, Louis; and Sair, Ralph A., 4,230,687, Cl. 424-22.000.

Griffiths, David W.: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,230,839, Cl. 526-75.000.

Grimm, Peter; and Burr, Peter, to Linde Aktiengesellschaft. Distillation of methane from a methane-containing crude gas. 4,230,469, Cl. 62-28.000.

Gristina, Anthony G., to Pfizer Inc. Total trispherical wrist prosthesis. 4,229,840, Cl. 3-1.910.

Gritschke, Martin: *See*—
Lohrberg, Karl; Pfohl, Rainer; Schubert, Jurgen; and Gritschke, Martin, 4,230,569, Cl. 210-754.000.

Grob, Ferdinand; and Rabus, Friedrich, to Robert Bosch GmbH. Method and system for electronic simulation of a freewheel. 4,231,092, Cl. 364-431.000.

Groginsky, Herbert L.: *See*—
Barr, Paul C.; and Groginsky, Herbert L., 4,231,102, Cl. 364-726.000.

Groome, Ernest J., to Clupak, Inc. Nip roll for treating web materials and method of manufacturing same. 4,230,036, Cl. 100-35.000.

Gross, Richard A.: *See*—
Hueter, O. William; and Gross, Richard A., 4,229,892, Cl. 40-152.100.

Gross, Stanley S.: *See*—
Bohm, George G. A.; and Gross, Stanley S., 4,230,649, Cl. 264-22.000.

Grossett, Kenneth W.: *See*—
Smith, James D. B.; Phillips, D. Colin; and Grossett, Kenneth W., 4,229,974, Cl. 73-339.00R.

Grote, James E.; and Hochandel, Thomas A., to J. E. Grote Pepp-A-Matic Co., Inc. Flexible meat slicing blade and support therefor. 4,230,007, Cl. 83-409.200.

Grottrup, Helmut. Matrix printer. 4,230,411, Cl. 400-121.000.

Grudzinskas, Charles V.: *See*—
Wissner, Allen; and Grudzinskas, Charles V., 4,230,879, Cl. 560-121.000.

Gsell, Laurenz: *See*—
Malherbe, Roger; Bellus, Daniel; and Gsell, Laurenz, 4,230,722, Cl. 424-301.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Lee, David Q.; and Rovnyak, Richard M., 4,230,912, Cl. 179-16.0EA.

GTE Products Corporation: *See*—
Brenner, Kurt H., Jr., 4,230,965, Cl. 313-407.000.
Clark, Donald L.; and Graves, William P., 4,231,021, Cl. 340-347.0DD.
LeFever, Randall H., 4,230,450, Cl. 431-361.000.

Guazzone, Bruno: *See*—
Muller, Hans; and Guazzone, Bruno, 4,230,576, Cl. 210-797.000.

Gueguen, Eugene. Automated casting line supply system. 4,230,308, Cl. 266-92.000.

Guenthner, Franz, to Jenaer Glaswerk Schott & Gen. Device for cutting glass. 4,230,010, Cl. 83-600.000.

Guibet, Jean-Pierre: *See*—
Rebours, Albert; and Guibet, Jean-Pierre, 4,230,468, Cl. 55-294.000.

Guignard, Claude, to Battelle Memorial Institute. Process for the manufacture of a plurality of filaments. 4,230,650, Cl. 264-24.000.

Guinn, David C.; Haggard, Archie K.; and Thomas, John P. Blow out preventer handling system. 4,230,190, Cl. 175-5.000.

Gulden, Peter: *See*—
Berg, Hermann O.; Gulden, Peter; Kostka, Hana; and Michel, Alfred, 4,230,443, Cl. 431-328.000.

Gulf Oil Corporation: *See*—
Carr, Norman L.; and Schmid, Bruce K., 4,230,556, Cl. 208-8.0LE.

Gunther, Herbert; and Blank, Herbert, to Du Pont de Nemours, E. I., and Company. High speed lithographic film element. 4,230,796, Cl. 430-523.000.

Gupta, Ved P.: *See*—
Crocker, Zenas; and Gupta, Ved P., 4,230,615, Cl. 260-34.200.

Gurries Company, The: *See*—
Gurries, Raymond A., 4,230,369, Cl. 299-14.000.

Gurries, Raymond A., to Gurries Company, The. Pavement planing method and apparatus. 4,230,369, Cl. 299-14.000.

Gusev, Vladimir A.; Oprisko, Jury I.; and Sorochinsky, Alexandr P. Method and installation for producing cast-in-situ piles. 4,230,425, Cl. 405-239.000.

Gutnick, David L.; and Rosenberg, Eugene, to Biotechnologie Aktiengesellschaft fur Emulsan. Production of α-emulsans. 4,230,801, Cl. 435-101.000.

H. B. Zachry Company: *See*—
Marten, Edward N., 4,230,372, Cl. 299-39.000.

H. Goodman & Sons Inc.: *See*—
Herzog, Milton W., 4,230,259, Cl. 229-38.000.

H. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M.; and Strauss, Edgars H., 4,230,204, Cl. 186-66.000.

Haack, William M.; and Peth, Dennis K., to Keene Corporation. Method and apparatus for producing artificial greenery. 4,230,657, Cl. 264-234.000.

Haak, Gary R., to Teletype Corporation. Cathode ray tube deflection circuit having display format selection. 4,230,974, Cl. 315-399.000.

Haase, Egon, to MOCO Maschinen- und Apparatebau GmbH & Co. KG. Comminuting plant. 4,230,282, Cl. 241-159.000.

Habecker, John W., to Cherry Electrical Products Corp. Seal assembly for switch actuator. 4,230,922, Cl. 200-302.000.

Habfast, Karleugen: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,230,907, Cl. 179-1.00E.

Haga, Takahiro: *See*—
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, 4,230,481, Cl. 71-92.000.

Hagale, James A.: *See*—
Cox, William J.; and Hagale, James A., 4,229,833, Cl. 2-16.000.

Hagaman, Jerry B.: *See*—
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.

Haggard, Archie K.: *See*—
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,230,190, Cl. 175-5.000.

Hajdu, Johann: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.

Halcon International, Inc.: *See*—
Khoobiar, Sargis, 4,230,639, Cl. 568-471.000.
Khoobiar, Sargis, 4,230,640, Cl. 568-477.000.

Hall, George R., to Keystone International, Inc. Slide gate. 4,229,907, Cl. 49-362.000.

Halliburton Company: *See*—
Sullaway, Bob L., 4,230,424, Cl. 405-227.000.

Hamada, Hiroyuki; Ichikawa, Rinjiro; and Suzuki, Hajime, to Toyo Boseki Kabushiki Kaisha. Laminated light-polarizing sheet. 4,230,768, Cl. 428-352.000.

Hamada, Nagaharu: *See*—
Hara, Toshitaka; and Hamada, Nagaharu, 4,231,032, Cl. 340-703.000.

Hamaguchi, Masayoshi; Watanabe, Hiroshi; and Hasegawa, Itaru, to Toray Industries, Inc. Yarn-introducing and take-up device applied to a winding machine. 4,230,283, Cl. 242-18.0PW.

Hamm, Robert A.; and Whitener, Philip C., to Boeing Commercial Airplane Company. Composite structure and method of making. 4,230,293, Cl. 244-119.000.

Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., to International Business Machines Corporation. Allocating and resolving next virtual pages for input-/output. 4,231,088, Cl. 364-200.000.

Hammonds, James C.: *See*—
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D., 4,230,430, Cl. 410-59.000.
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D., 4,230,431, Cl. 410-59.000.

Hanazawa, Toshio: *See*—
Sano, Yoshiaki; Hanazawa, Toshio; and Honda, Hideo, 4,230,980, Cl. 323-19.000.

Hanifin, John W., Jr.: *See*—
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,230,705, Cl. 424-250.000.

Hansen, Robert N.: *See*—
Avrea, Walter C.; and Hansen, Robert N., 4,230,336, Cl. 280-507.000.

Hansen, Sigurd S., to Nordish Fjerfabrik Aktieselskab. Ribbed tick with insulating filler. 4,230,756, Cl. 428-101.000.

Hansen, Walter I.; Galbraith, Wiley E.; Vella, Louis C.; and Cohen, Martin M., to Eltra Corporation. Digital typesetter. 4,231,096, Cl. 364-523.000.

Hansma, Hendrik; and Schroeder, Arnold, to Akzona Incorporated. Desensitized solution of dihydroperoxycyclohexane. 4,230,889, Cl. 568-559.000.

Hanson, Violet M.; and Strecker, Edgar, to Hanson, Violet M. Machine and method for manufacturing square or flat bottom bags having movable positions or stations including the use of a mandrel. 4,230,030, Cl. 93-35.0SB.

Hara, Kunio, to Nifco, Inc. Device for braking float motion in float-type liquid level gauge. 4,229,973, Cl. 73-317.000.

Hara, Toshitaka; and Hamada, Nagaharu, to Hitachi, Ltd. Variable accuracy trend graph display apparatus. 4,231,032, Cl. 340-703.000.

Hara, Yoshiaki: *See*—
Yamauchi, Aizo; Matsuzawa, Yasuo; Kamiya, Sadayoshi; Nishioka, Keisuke; Hara, Yoshiaki; and Matsushima, Shogo, 4,230,690, Cl. 424-78.000.

Harada, Takafumi: *See*—
Tsuchie, Kimihiro; and Harada, Takafumi, 4,230,212, Cl. 192-64.000.

Hardy, Michael F.; and Tgavalekos, Terry, to National Distillers and Chemical Corporation. Uniform hydrolysis catalyst addition to ethylene-vinyl ester polymers. 4,230,825, Cl. 525-62.000.

Hark, William B. Apparatus for making waves in a body of liquid. 4,229,969, Cl. 73-148.000.

Harper, Charles. Method of playing a baseball board game. 4,230,316, Cl. 273-93.00R.

Harris Corporation: *See*—
Taylor, David L., 4,231,056, Cl. 357-50.000.

Harris, Edward, to Koppers Company, Inc. Oven door. 4,230,532, Cl. 202-248.000.

Hart, Cullen P.; and Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Vehicle suspension system. 4,230,341, Cl. 280-702.000.

Hart, Dennis L., to Under Sea Industries, Inc. Environmental first stage scuba regulator. 4,230,140, Cl. 137-81.200.

Harthun, Norman E.: *See*—
Binasik, Chester S.; Vosper, Ralph R.; and Harthun, Norman E., 4,230,449, Cl. 431-353.000.

Hartley, E. Dale. Reciprocating piston device. 4,230,026, Cl. 92-138.000.

Hartman, George J.; and Ewing, Vernon R., to Earth Sciences, Inc.; National Steel Corporation; and Southwire Company. Process for recovering aluminum from alunite. 4,230,678, Cl. 423-112.000.

Hartman, Robert L.; Ilegems, Marc; Koszi, Louis A.; and Wagner, Wilfried R., to Bell Telephone Laboratories, Incorporated. Buried double heterostructure laser device. 4,230,997, Cl. 331-94.50H.

Harwood, Richard J., to Merck & Co., Inc. Transdermal delivery of drugs. 4,230,105, Cl. 128-156.000.

Hasegawa, Itaru: *See*—
Hamaguchi, Masayoshi; Watanabe, Hiroshi; and Hasegawa, Itaru, 4,230,283, Cl. 242-18.0PW.

Hasegawa, Yoshiro: *See*—
Kiriyama, Toshikatsu; and Hasegawa, Yoshiro, 4,231,017, Cl. 340-166.00R.

Hasegawa, Yukio: *See*—
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Watanabe, Tadaharu; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,230,703, Cl. 424-244.000.

Hashim, George A., to St. Luke's Hospital. Polypeptides useful for the purpose of treating multiple sclerosis. 4,230,696, Cl. 424-177.000.

Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, to Canon Kabushiki Kaisha. Mounting for interchangeable camera lens assembly with diaphragm means. 4,230,403, Cl. 354-286.000.

Hashimoto, Tsuneo: *See*—
Kobayashi, Hiroto; and Hashimoto, Tsuneo, 4,230,146, Cl. 137-494.000.

Hasizume, Masaharu: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,230,172, Cl. 164-192.000.

Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, to Braun Aktiengesellschaft. Dynamic loudspeaker able to be driven at increased steady power. 4,230,907, Cl. 179-1.00E.

Hasvold, Ketil, to Borregaard A/S. Method for the production of unbleached sulphite cellulose or bleached cellulose from a defibrated knot pulp. 4,230,524, Cl. 162-25.000.

Hataishi, Osamu: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, 4,231,057, Cl. 357-50.000.

Hatanaka, Yoshio: *See*—
Yoshida, Kiyotaka; Hatanaka, Yoshio; Kudo, Kesayoshi; and Aoki, Takao, 4,230,735, Cl. 426-557.000.

Hatcher, John C. Earth-working implement. 4,230,054, Cl. 111-62.000.

Hatfield, Lowell D.; Blaszczak, Larry C.; and Fisher, Jack W., to Eli Lilly and Company. Halogenating reagents. 4,230,644, Cl. 260-960.000.

Hatherill, Richard A.: *See*—
Davis, John Christopher H.; and Hatherill, Richard A., 4,230,908, Cl. 179-1.0CN.

Hattori, Tadashi; and Yamaguchi, Hiroaki, to Nippon Soken, Inc. Ignition control apparatus for internal combustion engine. 4,230,078, Cl. 123-416.000.

Hauenstein, Jack D.; and Broderick, Thomas E., to Goodyear Tire & Rubber Company, The. Eliminating acetaldehyde from crystalline polyethylene terephthalate resin. 4,230,819, Cl. 528-483.000.

Hauff, Alfred: *See*—
Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, 4,230,739, Cl. 427-42.000.

Haug, Edward W., to Barber-Colman Company. Material saving cutter blade. 4,230,428, Cl. 407-116.000.

Havera, Herbert J.; and Strycker, Wallace G., to Miles Laboratories, Inc. Amide derivatives of 2-substituted anilino-hexahydrobenzo[a]-quinolizines, and methods of treating hypertension employing them. 4,230,710, Cl. 424-258.000.

Hawkins, Irvin F., Jr. Needle sheath complex and process for decompression and biopsy. 4,230,123, Cl. 128-658.000.

Hayashi, Tadashi: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, 4,230,658, Cl. 264-235.800.

Hayashi, Toshio: *See*—
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.

Hayashi, Yoshimasa: *See*—
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,230,087, Cl. 123-193.0CH.

Hayter, Jerald D.: *See*—
Judge, Kenneth E.; and Hayter, Jerald D., 4,230,091, Cl. 126-77.000.

Hayward Tyler Pump Company: *See*—
Chalmers, Dennis W., 4,230,144, Cl. 137-343.000.

Heap, David L.; and Kenner, Allen L., to Sperry Rand Corporation. Performance monitor apparatus and method. 4,231,106, Cl. 364-900.000.

Hebert, Donald G., to Falk, Helmut. Matrix print head assembly. 4,230,038, Cl. 101-93.050.

Hebert, Donald G., to Falk, Helmut. Matrix print head assembly. 4,230,412, Cl. 400-124.000.

Heider, Henning; and Wieske, Theophil, to Lever Brothers Company. Margarine fat. 4,230,737, Cl. 426-607.000.

Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, to Hoechst Aktiengesellschaft. Pressure-resistant polyurethane-polyurea particles for the encapsulation of active ingredients and process for their manufacture. 4,230,809, Cl. 521-65.000.

Heinrichs, Friedrich. Device for counting and sorting coins. 4,230,136, Cl. 133-3.00E.

Heinzelmann, Karl-Georg: *See*—
Distler, Walter; and Heinzelmann, Karl-Georg, 4,230,949, Cl. 250-445.00T.

Helene Curtis Industries, Inc.: *See*—
Forsberg, John R., 4,230,279, Cl. 239-559.000.

Heller, Lawrence G., to International Business Machines Corporation. Permanent or semipermanent charge transfer storage systems. 4,230,954, Cl. 307-238.000.

Heller, Wilhelm; Knoor, Walter; and Schweitzer, Reinhard, to Fried. Krupp Huttenwerke AG. Abrasion resistant rails and/or rail wheels, and process for producing the same. 4,230,488, Cl. 75-123.00F.

Heminover, Stephen R. Article of wearing apparel. 4,231,079, Cl. 362-106.000.

Hems, Roger: *See*—
Rowsell, David G.; Spring, David J.; and Hems, Roger, 4,230,688, Cl. 424-45.000.

Henderson, Claude L.; and Abner, Edmund L., to General Aviation Electronics, Inc. Modular radio. 4,231,115, Cl. 455-73.000.

Henggeler-Achermann, Josy, to Lega-Norm AG. Compressible holding member. 4,230,310, Cl. 269-316.000.

Henis, Jay M. S.; and Tripodi, Mary K., to Monsanto Company. Multicomponent membranes for gas separations. 4,230,463, Cl. 55-16.000.

Henkel, Otto, to Vereinigte Flugtechnische Werke-Fokker GmbH. Positioning and orienting a mobile equipment carrier for an antenna mast. 4,231,044, Cl. 343-881.000.

Henriques, Joseph. Method and apparatus for improvements in convective heating. 4,230,092, Cl. 126-126.000.

Henschen, Irvin C.: *See*—
Kalaf, George P.; and Henschen, Irvin C., 4,230,059, Cl. 114-20.00R.

Hentschel, Bernhard: *See*—
Coenen, Alfred; Kosswig, Kurt; Hentschel, Bernhard; and Ziebarth, Jurgen, 4,230,681, Cl. 423-481.000.

Hepar Chimie S.A.: *See*—
Fussi, Fernando; and Fedeli, Gianfranco, 4,230,699, Cl. 424-181.000.

Hercouet, Alain: *See*—
Le Corre, Maurice; Hercouet, Alain; and Begasse, Beatrice, 4,230,624, Cl. 260-345.200.

Hermann Kronseder: *See*—
Fahnrich, Adolf, 4,230,518, Cl. 156-456.000.

Hermes Susstoff AG: *See*—
de Wit, Erik, 4,230,237, Cl. 221-298.000.

Heronema, Joseph D. Outside corner finishing tool. 4,230,441, Cl. 425-87.000.

Herve et Fils, S.A.: *See*—
Denay, Andre M. J.; and Bouge, Pierre M. J., 4,230,262, Cl. 229-69.000.

Herzog, Milton W., to H. Goodman & Sons Inc. Self-locking cartons. 4,230,259, Cl. 229-38.000.

Hewgill, Douglas F.: *See*—
Archer, Anthony M.; Cambridge, Edward L.; and Hewgill, Douglas F., 4,230,540, Cl. 204-67.000.

Hewlett-Packard Company: *See*—
Stelting, Raymond B., 4,230,988, Cl. 324-439.000.
Vincent, Kent D., 4,230,550, Cl. 204-159.230.

Hicks, Alan A.: *See*—
Breslow, Jeffrey D.; Hicks, Alan A.; Jaworski, Eugene; and Meyer, Burton C., 4,230,317, Cl. 273-119.00A.

Hidaka, Tsuneo; Inoue, Masahide; and Ebihara, Masatomi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Prosthetic teeth and bones. 4,230,455, Cl. 433-202.000.

Higgerson, Raymond; and Parsons, David, to Automotive Products Limited. Hydraulic master cylinder. 4,229,940, Cl. 60-562.000.

High Stoy Technological Corporation: *See*—
Pickering, Norman C.; and Bronson, Nathaniel R., II, 4,230,124, Cl. 128-660.000.

High Voltage Engineering Corporation: *See*—
Cram, Robert D., 4,230,947, Cl. 250-434.000.

Highway Equipment Company: *See*—
Leigh, Theodore M.; and Rawson, James L., 4,230,280, Cl. 239-677.000.

Hildebrand, Daniel H., to Ford Motor Company. Compact four speed automatic transmission. 4,229,996, Cl. 74-688.000.

Hill, Doyle E., to Eastman Kodak Company. Calibrator composition based upon dialyzed blood serum. 4,230,601, Cl. 252-408.000.

Hill, Herbert M.; and Shrader, Donald R. Scrap chopper. 4,230,281, Cl. 241-142.000.

Hill, Martin J., to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions useful in dry film photoresist. 4,230,790, Cl. 430-288.000.

Hilscher, Eduard: *See*—
Disselbeck, Dieter; Hilscher, Eduard; and Speier, Klaus, 4,230,175, Cl. 165-46.000.

Hinsken, Hans: *See*—
Drake, William O.; Hinsken, Hans; Mayerhoefer, Horst; and Mueller, Wolfgang H., 4,230,857, Cl. 544-388.000.

Hintsch, Otto, to Sulzer Brothers Ltd. Cleaning means for a weaving machine. 4,230,158, Cl. 139-1.00C.

Hintsch, Otto, to Sulzer Brothers Ltd. Clutch for a textile machine. 4,230,210, Cl. 192-28.000.

Hirabayashi, Kazuyoshi: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,230,852, Cl. 544-189.000.

Hirano, Hiroshi: *See*—
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.

Hirs, Gene. Filter method and apparatus. 4,230,572, Cl. 210-767.000.

Hitachi Cable Ltd.: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, 4,231,116, Cl. 455-87.000.

Hitachi, Ltd.: *See*—
Hara, Toshitaka; and Hamada, Nagaharu, 4,231,032, Cl. 340-703.000.
Ito, Tomo, 4,230,077, Cl. 123-389.000.
Iwamoto, Taro; Ando, Shimon; Kurokawa, Koji; and Kusumoto, Sho, 4,230,067, Cl. 118-104.000.
Kiriyama, Toshikatsu; and Hasegawa, Yoshiro, 4,231,017, Cl. 340-166.00R.
Kosugi, Hiroshi; Inoue, Hirofumi; and Shirasu, Hirotoshi, 4,231,022, Cl. 340-347.0DA.
Matsuda, Toshiharu; Miyamoto, Seigo; and Minoshima, Yasuo, 4,230,470, Cl. 62-197.000.
Matsuda, Yasuo; Honda, Kazuo; and Muto, Nobuyoshi, 4,231,083, Cl. 363-135.000.
Mikamo, Kathumi; Ichimura, Shinya; and Yamaguchi, Kenichi, 4,230,932, Cl. 219-370.000.
Oguro, Tomokatsu, 4,230,968, Cl. 315-39.510.
Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, 4,231,116, Cl. 455-87.000.
Yoshizaki, Masaaki; and Mizuno, Kenichi, 4,231,084, Cl. 364-200.000.

Hitachi Maxell, Ltd.: *See*—
Okada, Shuhei; Uozumi, Masana; Matsuura, Masanori; and Sadaike, Masazumi, 4,230,225, Cl. 206-387.000.

Hitora, Shozo, to Sasaki Electric Mfg. Co. Ltd. Beam-rotary lamp. 4,231,078, Cl. 362-35.000.

Hittman Corporation: *See*—
Bustard, Thomas S.; and Pohl, Corriene S., 4,230,597, Cl. 252-301.10W.

Hochandel, Thomas A.: *See*—
Grote, James E.; and Hochandel, Thomas A., 4,230,007, Cl. 83-409.200.

Hoechst Aktiengesellschaft: *See*—
Disselbeck, Dieter; Hilscher, Eduard; and Speier, Klaus, 4,230,175, Cl. 165-46.000.
Eichhorn, Wilfried; and Seibel, Peter, 4,230,643, Cl. 525-253.000.
Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, 4,230,809, Cl. 521-65.000.

Hoelzel, Fred L., Jr. One piece, collapsible package. 4,230,729, Cl. 426-124.000.

Hoffmann-La Roche Inc.: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Despreaux, Carl; Narwid, Thomas A.; Palleroni, Norberto J.; and Uskokovic, Milan R., 4,230,625, Cl. 260-397.100.
Holick, Michael F.; and Uskokovic, Milan R., 4,230,701, Cl. 424-236.000.
Hromatka, Otto; and Binder, Dieter, 4,230,873, Cl. 549-64.000.
Klaus, Michael J.; and Pawson, Beverly A., 4,230,872, Cl. 549-62.000.

Hogg, Klaus: *See*—
Knoll, Hartwig; Hogg, Klaus; and Laudenberg, Hermann, 4,229,884, Cl. 33-174.00L.

Hohne, Wolfgang: *See*—
Tork, Leo; Kolb, Gunter; and Hohne, Wolfgang, 4,230,812, Cl. 526-320.000.

Holford, Kenneth, to U.S. Philips Corporation. Doppler radar device. 4,231,038, Cl. 343-5.0DD.

Holick, Michael F.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Administration of biologically active vitamin D_3 and vitamin D_2 materials. 4,230,701, Cl. 424-236.000.

Holman, Rury R.; and Turner, Robert C. Automatic lancet. 4,230,118, Cl. 128-314.000.

Holman, Thomas L.: *See*—
Textoris, Melvin A.; and Holman, Thomas L., 4,229,917, Cl. 52-239.000.

Holtvoigt, Werner: *See*—
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,230,612, Cl. 260-33.20R.

Holy, Antonin: *See*—
De Clercq, Erik; and Holy, Antonin, 4,230,708, Cl. 424-253.000.

Holz, George E.; Ogle, James A.; and Przybylek, George J., to Burroughs Corporation. Cathode ray tube with touch-sensitive display panel. 4,230,967, Cl. 315-3.000.

Holzworth, William T.: *See*—
Enright, John J.; and Holzworth, William T., 4,230,253, Cl. 228-152.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, 4,230,084, Cl. 123-179.00S.

Honda, Hideo: *See*—
Sano, Yoshiaki; Hanazawa, Toshio; and Honda, Hideo, 4,230,980, Cl. 323-19.000.

Honda, Kazuo: *See*—
Matsuda, Yasuo; Honda, Kazuo; and Muto, Nobuyoshi, 4,231,083, Cl. 363-135.000.

Honeywell Inc.: *See*—
Fitch, Robert C.; and Narendra, Patrenahalli M., 4,231,065, Cl. 358-166.000.
Forss, John A.; and Lee, Tzuo-Chang, 4,230,950, Cl. 250-574.000.
Merchant, John, 4,231,066, Cl. 358-180.000.
Stauffer, Norman L., 4,230,941, Cl. 250-204.000.
Stauffer, Norman L., 4,230,942, Cl. 250-204.000.

Honeywell Information Systems, Inc.: *See*—
Tarbox, Bruce H.; Bruce, Kenneth E.; Conway, John W.; and Lombardo, Ralph M., Jr., 4,231,086, Cl. 364-200.000.

Hoogovens Ijmuiden, B.V.: *See*—
Evans, Sheldon, 4,230,807, Cl. 521-26.000.

Hooker Chemicals & Plastics Corp.: *See*—
Cooke, Victor F. G.; and Thorpe, Donald H., 4,230,813, Cl. 526-329.000.

Hope, Charles S., to Solwin Industries, Inc. Method of and system for generating energy from solar and wind energy sources. 4,229,941, Cl. 60-641.000.

Hope, Mrs. Edward. Pollution control apparatus and method. 4,230,465, Cl. 55-83.000.

Horie, Shigeru: *See*—
Saito, Masao; Aoyama, Tetsuo; Horie, Shigeru; and Takada, Kazuo, 4,230,636, Cl. 260-561.00R.

Horike, Masanori; Jinnai, Koichiro; and Iwasaki, Kyuhachiro, to Kodama, Yutaka; and Ricoh Co., Ltd. Ink jet recording apparatus. 4,231,048, Cl. 346-140.00R.

Horike, Masanori: *See*—
Iwasaki, Kyuhachiro; Kodama, Yutaka; Jinnai, Koichiro; and Horike, Masanori, 4,231,047, Cl. 346-75.000.

Horne, Fred H., to Ellis Paperboard Products, Inc. Composite structural system and method and applications to pallets and platforms. 4,230,049, Cl. 108-51.100.

Horwitt, Laurence G.; and Mattis, Donald J., to Sun Chemical Corporation. Electric cigar lighter. 4,230,931, Cl. 219-265.000.

Hoshino Gakki Ten, Inc.: *See*—
Hoshino, Yoshihiro, 4,230,014, Cl. 84-299.000.

Hoshino, Yoshihiro, to Hoshino Gakki Ten, Inc. Securement of guitar bridge to guitar body. 4,230,014, Cl. 84-299.000.

Houle, Peter C.: *See*—
Buchwald, Hubert W.; and Houle, Peter C., 4,230,467, Cl. 55-178.000.

Howard, James; and Gombar, Oscar J., to Cities Service Company. Pigments dispersible in plastics. 4,230,501, Cl. 106-308.00Q.

Howard, Leroy J., to UOP Inc. Heat-pumped fractionation process. 4,230,535, Cl. 203-26.000.

Howe, Robert K.: *See*—
Liu, Kou-Chang; and Howe, Robert K., 4,230,866, Cl. 548-247.000.

Howell, Russell B., to Fairchild Industries, Inc. Track fastener. 4,230,432, Cl. 410-102.000.

Hower, Philip L.; and Page, Derrick J., to Westinghouse Electric Corp. Technique for controlling emitter ballast resistance. 4,231,059, Cl. 357-68.000.

Hromatka, Otto; and Binder, Dieter, to Hoffmann-La Roche Inc. Thiophene derivatives. 4,230,873, Cl. 549-64.000.

Hu, Mae W.: *See—*
Singh, Prithipal; and Hu, Mae W., 4,230,805, Cl. 435-188.000.

Huber, Bernhard W., to Bodenseewerk Perkin-Elmer & Co., GmbH. Apparatus for automatically generating and measuring gaseous measuring samples from a series of liquid samples. 4,230,665, Cl. 422-64.000.

Huch, Albert: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 4,230,122, Cl. 128-635.000.

Huck Manufacturing Company: *See—*
Angelosanto, Donald J., 4,230,017, Cl. 85-70.000.

Hudd, Anthony W., to IMI Refiners Limited. Continuous casting of metals. 4,230,006, Cl. 83-319.000.

Hueter, O. William; and Gross, Richard A., to Hueter, O. William. Display device. 4,229,892, Cl. 40-152.100.

Hug, William F.; and De Benedictis, Leonard C., to Xerox Corporation. Modular laser printing system. 4,230,902, Cl. 178-15.000.

Hughes, John F., to Cellcor Corporation of Canada Limited. Apparatus for producing modified starch products. 4,230,503, Cl. 127-1.000.

Hughes, Robert S., to Oakwood Manufacturing, Inc. Kit of components for interconnecting structural members, and method of utilizing same. 4,229,919, Cl. 52-263.000.

Hunsberger, Dennis J.; Nahabedian, Charles E.; Quinn, Thomas M.; and VanOrnum, James H., to Bell Telephone Laboratories, Incorporated. Microprocessor support system. 4,231,087, Cl. 364-200.000.

Hunt, Geoffrey H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Optical screens. 4,231,068, Cl. 358-252.000.

Husky Injection Molding Systems Limited: *See—*
Rees, Herbert; and Robinson, Allan H., 4,230,442, Cl. 425-451.200.

Huss, Heinrich. Device for the continuous developing of band- and sheet-shaped photographic layer carriers. 4,230,404, Cl. 354-321.000.

Hutchinson, Ronald, to Marconi Company Limited, The. Constant resistance coupling network. 4,231,001, Cl. 333-110.000.

Hydes, Paul C.; and Malerbi, Bernard W., to Johnson, Matthey & Co., Limited. Platinum coordination compounds. 4,230,631, Cl. 260-429.00R.

Hydrocarbon Research, Inc.: *See—*
Daly, Francis P., 4,230,895, Cl. 568-805.000.
Daly, Francis P., 4,230,896, Cl. 568-805.000.

Ichikawa, Rinjiro: *See—*
Hamada, Hiroyuki; Ichikawa, Rinjiro; and Suzuki, Hajime, 4,230,768, Cl. 428-352.000.

Ichikawa, Satoru; and Minami, Shunji, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle type internal combustion engine having optimally disposed valve actuating mechanisms. 4,230,074, Cl. 123-55.00R.

Ichikawa, Toshizi; and Watanabe, Teruko, to Terumo Corporation. Liquid separating composition and apparatus for applying said composition. 4,230,584, Cl. 210-516.000.

Ichimura, Shinya: *See—*
Mikamo, Kathumi; Ichimura, Shinya; and Yamaguchi, Kenichi, 4,230,932, Cl. 219-370.000.

ICI Americas Inc.: *See—*
Bare, Thomas M., 4,230,713, Cl. 424-263.000.

ICI Australia Limited: *See—*
Bailey, John R. W.; Carter, Michael R. L.; and Fox, Richard, 4,230,041, Cl. 102-27.00R.

ICI United States, Inc.: *See—*
Gauthier, Donald R., 4,230,618, Cl. 260-187.000.

Iguchi, Morimichi: *See—*
Sano, Seisuke; Maeda, Masato; and Iguchi, Morimichi, 4,230,555, Cl. 204-195.00S.

Iino, Fujio, to Kabushiki Kaisha Mitsu Miike Seisakusho. Vertical bulk-conveying apparatus and bulk delivering system utilizing the characteristics thereof. 4,230,220, Cl. 198-509.000.

Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Complementary MOS transistors without an isolation region. 4,231,055, Cl. 357-42.000.

Ikegami, Tadashi: *See—*
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; Moriguchi, Kisoo; and Mizutani, Shigeru, 4,230,831, Cl. 525-240.000.

Ilegems, Marc: *See—*
Hartman, Robert L.; Ilegems, Marc; Koszi, Louis A.; and Wagner, Wilfried R., 4,230,997, Cl. 331-94.50H.

Illinois Tool Works Inc.: *See—*
Walz, Arthur J., Jr.; and Nowacki, Christopher A., 4,230,115, Cl. 128-295.000.

Ilnyckyj, Stephen, to Exxon Research & Engineering Co. Copolymers of ethylene and ethylenically unsaturated monomers, process for their preparation and distillate oil containing said copolymers. 4,230,811, Cl. 526-227.000.

IMI Refiners Limited: *See—*
Hudd, Anthony W., 4,230,006, Cl. 83-319.000.

Imigawa, Masayuki; and Mori, Toshihiro, to Nippon Electric Co., Ltd. Tone signal detector. 4,231,018, Cl. 340-171.00R.

Imperial Chemical Industries Limited: *See—*
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., 4,230,484, Cl. 71-111.000.
Benzie, Robert J.; and Waddan, Dhafir Y., 4,230,634, Cl. 260-465.300.
Roesler, Frank C., deceased, 4,230,563, Cl. 210-629.000.

Inaba, Masao: *See—*
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.

Ingles, Orrin E. Weather proof radio tower bearing assembly. 4,231,045, Cl. 343-882.000.

Ingro, Ben. Carburetion. 4,230,647, Cl. 261-78.00R.

Inokawa, Tsuneo: *See—*
Oshima, Masanao; Komoto, Mikihisa; Yabuki, Shoichi; and Inokawa, Tsuneo, 4,230,423, Cl. 405-211.000.

Inoue, Hirofumi: *See—*
Kosugi, Hiroshi; Inoue, Hirofumi; and Shirasu, Hirotoshi, 4,231,022, Cl. 340-347.0DA.

Inoue, Masahide: *See—*
Hidaka, Tsuneo; Inoue, Masahide; and Ebihara, Masatomi, 4,230,455, Cl. 433-202.000.

Inoue, Yuzo: *See—*
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.

Institut Francais du Petrol: *See—*
Cosyns, Jean; Stern, Robert; and Le Page, Jean-Francois, 4,230,897, Cl. 585-260.000.

INTERATOM, International Atomreaktorbau GmbH: *See—*
Kastl, Johann; and Schutz, Heinrich, 4,230,410, Cl. 366-177.000.

Intercane Systems, Inc.: *See—*
Tilby, Sydney E., 4,230,733, Cl. 426-429.000.

International Business Machines Corporation: *See—*
Azzis, Daniel; and Delaporte, Francois X., 4,231,020, Cl. 340-347.0DA.
Bakos, Peter, 4,230,773, Cl. 428-447.000.
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.
Blasbalg, Herman L., 4,231,113, Cl. 455-29.000.
Desblache, Andre E., 4,231,094, Cl. 364-514.000.
Gajda, Joseph J., 4,230,523, Cl. 156-657.000.
Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., 4,231,088, Cl. 364-200.000.
Heller, Lawrence G., 4,230,954, Cl. 307-238.000.

International Harvester Company: *See—*
Staiert, Richard W., 4,230,130, Cl. 130-27.00R.

International Standard Electric Corporation: *See—*
Greenwood, John C., 4,229,979, Cl. 73-704.000.

International Telephone and Telegraph Corporation: *See—*
Anhalt, John W., 4,230,384, Cl. 339-17.00R.
Fellinger, Frank; and Ruffing, James M., 4,230,911, Cl. 370-84.000.

Intertechnique: *See—*
Beaussant, Raymond; and Claude, Jacques, 4,230,097, Cl. 128-1.00A.

Ionics Inc.: *See—*
McRae, Wayne A., 4,230,544, Cl. 204-98.000.

Irons, Henry R.: *See—*
Schwee, Leonard J.; Irons, Henry R.; and Anderson, Wallace E., 4,231,107, Cl. 365-87.000.

Irro, Fritz: *See—*
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.

Irvine Enterprises Inc.: *See—*
Dotschkal, Anton A.; and Massaro, James J., 4,230,267, Cl. 236-9.00A.

Irving, Stephen J., to National Research Development Corporation. Aerator. 4,230,570, Cl. 210-758.000.

Irwin, David C. Cattle skinning process and apparatus therefor. 4,229,860, Cl. 17-50.000.

Isaka, Tsutomu; Matsuo, Maki; and Miyazaki, Yukinobu, to Toyo Boseki Kabushiki Kaisha. Heat sealable laminated propylene polymer packaging material. 4,230,767, Cl. 428-349.000.

Isawa, Kazuo: *See—*
Saruwatari, Kohichi; Isawa, Kazuo; Maejima, Masatsugu; and Suzuki, Takao, 4,230,539, Cl. 204-35.00N.

Ishida, Eisuke: *See—*
Nishiguchi, Hisanori; Ishida, Eisuke; and Takashima, Yuji, 4,230,784, Cl. 430-42.000.

Ishihara Sangyo Kaisha Limited: *See—*
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, 4,230,481, Cl. 71-92.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Tsujii, Yasuhiro; and Shigehara, Itaru, 4,230,642, Cl. 570-193.000.

Ishii, Michio: *See—*
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, 4,230,168, Cl. 152-310.000.

Ishimaru, Hajime, to Director-General of National Laboratory for High Energy Physics, The. Shield-type coaxial vacuum feedthrough. 4,231,003, Cl. 333-33.000.

Isobe, Takashi: *See—*
Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, 4,230,403, Cl. 354-286.000.

ITI Limited: *See—*
Mougin, Georges L., 4,230,418, Cl. 405-52.000.

Ito, Hiroshi: *See—*
Yamazaki, Hitoshi; and Ito, Hiroshi, 4,230,741, Cl. 427-67.000.

Ito, Sumio: *See—*
Nohira, Hidetaka; Ito, Sumio; Oki, Hisashi; and Kumai, Teruo, 4,230,073, Cl. 123-308.000.

Ito, Tomo, to Hitachi, Ltd. Vacuum operated servo. 4,230,077, Cl. 123-389.000.

Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, to Nippon Electric Co., Ltd. Frame synchronizer having a write-inhibit circuit. 4,231,063, Cl. 358-148.000.

Itoh, Kunio; and Kumagae, Kimitaka, to Shin-Etsu Chemical Co., Ltd. Silicon-containing polybutadiene derivatives and method for the preparation thereof. 4,230,815, Cl. 526-335.000.

Itoh, Tsutomu; Ouchi, Kenji; Furuya, Nobuo; and Shimizu, Takeo, to Onoda Cement Company, Ltd. Apparatus used in continuous process for electrostatic coating with pulverized material. 4,230,068, Cl. 118-634.000.

ITT Industries, Inc.: *See*—
Tol, Dirk, 4,230,304, Cl. 254-89.00H.

IUC International, Inc.: *See*—
Butler, Glenn J., 4,230,107, Cl. 128-205.260.

Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Orban, Jozsef. Integral servo steering gear with rack transmission. 4,230,020, Cl. 91-422.000.

Iwaki, Takashi; Tanaka, Takeji; Tanaka, Yoshitomo; and Tanaka, Hiroshi, to Yuwa-Sangyo Kabushiki-Kaisha. Method and apparatus for manufacturing box-shaped structure from metal sheet. 4,230,058, Cl. 113-1.00R.

Iwami, Naoki: *See*—
Aoki, Takao; Kadowaki, Hidejiro; and Iwami, Naoki, 4,230,783, Cl. 430-42.000.

Iwamoto, Taro; Ando, Shimon; Kurokawa, Koji; and Kusumoto, Sho, to Hitachi, Ltd. Liquid applying apparatus. 4,230,067, Cl. 118-104.000.

Iwamuro, Yoshiyuki: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,230,525, Cl. 162-164.00R.

Iwasaki, Hajime; Mizuta, Kuninori; Kobayashi, Yoshinori; Yoshikawa, Tadayoshi; and Muraoka, Kyouzi, to Mitsui Petrochemical Industries Ltd.; and Mitsuboshi Sangyo Co., Ltd. Asphalt water-proofing material. 4,230,762, Cl. 428-234.000.

Iwasaki, Kyuhachiro; Kodama, Yutaka; Jinnai, Koichiro; and Horike, Masanori, to Ricoh Co., Ltd. Ink-jet printing method and device therefor. 4,231,047, Cl. 346-75.000.

Iwasaki, Kyuhachiro: *See*—
Horike, Masanori; Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,231,048, Cl. 346-140.00R.

Iwase, Osamu: *See*—
Yoshihara, Ichiro; Watanabe, Tadashi; and Iwase, Osamu, 4,230,829, Cl. 525-162.000.

Iwata, Kazuhide: *See*—
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,231,097, Cl. 364-577.000.

Izzo, Henry J.; Moran, Martin J.; and Wheeler, Frederick G., to Armour-Dial, Inc. Antacid tablets and processes for their preparation. 4,230,693, Cl. 424-156.000.

J. E. Grote Pepp-A-Matic Co., Inc.: *See*—
Grote, James E.; and Hochandel, Thomas A., 4,230,007, Cl. 83-409.200.

J. J. Keller & Associates, Inc.: *See*—
Keller, Robert L., 4,229,891, Cl. 40-17.000.

J. M. Huber Corporation: *See*—
Takewell, Robert B., 4,230,458, Cl. 23-313.0AS.
Wagner, Joseph E., III; and Williams, Lloyd E., 4,230,593, Cl. 252-179.000.

J. S. Staedtler: *See*—
Gartner, Jurgen, 4,230,413, Cl. 401-65.000.

J. Sainsbury Limited: *See*—
Day, Timothy T., 4,229,927, Cl. 53-433.000.

Jackson, Michael V., to Farmhand (U.K.) Limited. Bale collector. 4,230,433, Cl. 414-111.000.

Jackson, Warren M. Adjustable holder for the stationary die of a thread rolling machine. 4,229,966, Cl. 72-469.000.

Jacobs, Bernardus A. J.: *See*—
Dil, Jan G.; and Jacobs, Bernardus A. J., 4,230,915, Cl. 179-100.10G.

Jacobson, Mark: *See*—
Belttari, Stanley C.; and Jacobson, Mark, 4,230,427, Cl. 407-91.000.

Jacquelin, Jean, to Societe Anonyme dite: Compagnie Generale d'Electricite. Sodium-sulphur electric cell. 4,230,780, Cl. 429-104.000.

Jagnow, H. J., to Bergwerksverband GmbH. Method for starting up plant for producing fine coke. 4,230,528, Cl. 201-12.000.

James, Richard N., agent: *See*—
Marshall II, John, deceased, 4,230,291, Cl. 244-17.110.

Jamesbury Corporation: *See*—
Caliri, Charles T., 4,230,025, Cl. 92-31.000.

Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., to Lilly Industries Limited. Method of treating asthma with alkyl, alkylidene and alkylene hydantoins. 4,230,709, Cl. 424-256.000.

Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., to Eli Lilly Industries Limited. Treating immediate hypersensitivity conditions with 3,5-disubstituted hydantoin derivatives. 4,230,716, Cl. 424-273.00R.

Janssen, Harvey W., to Wolff Manufacturing Company. Method and machine for rebuilding track roller assemblies. 4,230,928, Cl. 219-76.110.

Janssen, Hermann J., to Sulzer Brothers Ltd. Burner for a fluid fuel. 4,230,445, Cl. 431-116.000.

Japanese National Railways: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.

Jasani, Shirish: *See*—
Roennau, Raymond B.; Chung, Daniel A.; and Jasani, Shirish, 4,230,770, Cl. 428-424.400.

Jaworski, Eugene: *See*—
Breslow, Jeffrey D.; Hicks, Alan A.; Jaworski, Eugene; and Meyer, Burton C., 4,230,317, Cl. 273-119.00A.

Jedlicka, Daniel M., to Caterpillar Tractor Co. Flexible coupling. 4,229,951, Cl. 64-14.000.

Jenaer Glaswerk Schott & Gen.: *See*—
Guenthner, Franz, 4,230,010, Cl. 83-600.000.

Jeppsson, Jan-Bertil, to AB Akerlund & Rausing. Device for induction welding. 4,230,923, Cl. 219-10.530.

Jet, Inc.: *See*—
Culp, Richard E.; and Baker, Robert G., 4,230,578, Cl. 210-86.000.

Jewell, Henry J.; and Meyer, Richard L., to Viewpoint, Inc. Television image projection apparatus. 4,231,067, Cl. 358-237.000.

JGC Corporation: *See*—
Tsuchiya, Fujio; Yamamoto, Kenzo; Yamaguchi, Katsunobu; and Okagami, Akio, 4,230,886, Cl. 562-486.000.

Jinnai, Koichiro: *See*—
Horike, Masanori; Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,231,048, Cl. 346-140.00R.
Iwasaki, Kyuhachiro; Kodama, Yutaka; Jinnai, Koichiro; and Horike, Masanori, 4,231,047, Cl. 346-75.000.

Johannessen, Paul R., to Megapulse Incorporated. Method of and apparatus for eliminating priming and carrier sweep-out losses in SCR switching circuits and the like. 4,230,955, Cl. 307-252.00J.

John Zink Company: *See*—
Reed, Robert D., 4,230,278, Cl. 239-427.500.

Johnson, Aldus, to Lambert, William H. Mobile cart. 4,230,329, Cl. 280-43.170.

Johnson Controls, Inc.: *See*—
Matthews, Russell B., 4,230,444, Cl. 431-6.000.

Johnson & Johnson: *See*—
Beroff, Howard, 4,230,110, Cl. 128-214.400.

Johnson, Matthey & Co., Limited: *See*—
Hydes, Paul C.; and Malerbi, Bernard W., 4,230,631, Cl. 260-429.00R.

Johnson, Sterling V. Rider propelled toy vehicle. 4,230,331, Cl. 280-218.000.

Johnston, Jesse C., Jr., to Babcock & Wilcox Company, The. Soot blower construction. 4,229,854, Cl. 15-316.00R.

Johnston, Paul M., to Westinghouse Electric Corp. Automatic transfer control device and frequency monitor. 4,231,029, Cl. 340-658.000.

Jones, C. David: *See*—
Suarez, Tulio; and Jones, C. David, 4,230,862, Cl. 546-237.000.

Jones, James E., to Dow Corning Corporation. Capillary thermometer containing visible silicone fluid. 4,229,976, Cl. 73-371.000.

Jones, Winton D.: *See*—
Albrecht, William L.; and Jones, Winton D., 4,230,715, Cl. 424-269.000.

Jonson, Sven M., to Mohog AB. Method of sawing and stacking board. 4,230,004, Cl. 83-23.000.

Jonsson, Ulf R. S. Pinch valve. 4,230,151, Cl. 137-595.000.

Joyce, James E.; and Joyce, John P. Light toy. 4,231,077, Cl. 362-32.000.

Joyce, John P.: *See*—
Joyce, James E.; and Joyce, John P., 4,231,077, Cl. 362-32.000.

Judge, Kenneth E.; and Hayter, Jerald D., to Carmor Manufacturing Ltd. Stove. 4,230,091, Cl. 126-77.000.

Jungblut, Camille: *See*—
Foy, Paul; Jungblut, Camille; and Deleens, Gerard, 4,230,838, Cl. 525-408.000.

Junginger, Klaus M.; and Kieferle, Hermann, to Stierlen-Maquet Aktiengesellschaft. Remote control arrangement for a medical appliance. 4,231,019, Cl. 340-171.00R.

Jurich, Mike, III. Rapid loading device for a revolver. 4,229,896, Cl. 42-89.000.

Jurick, Martin H.: *See*—
Potter, Gene B.; and Jurick, Martin H., 4,230,970, Cl. 315-307.000.

Jurschewitz, Paul A. W. System for regulating the fuel supply of an internal combustion engine. 4,230,082, Cl. 123-518.000.

Juvinall, John W., to Owens-Illinois, Inc. Method and apparatus of cavity identification of mold of origin of a glass container. 4,230,266, Cl. 235-490.000.

Jyojiki, Masao: *See*—
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, 4,230,401, Cl. 354-25.000.

K. G. Derman AB: *See*—
Derman, Karl G., 4,230,324, Cl. 277-74.000.

Kaartinen, Niilo H., to Packard Instrument Company, Inc. Apparatus for processing fluid materials particularly in the preparation of samples for radioactive isotope tracer studies. 4,230,671, Cl. 422-159.000.

Kabushiki Kaisha Maruyama Seisakusho: *See*—
Shimizu, Yoichi, 4,230,159, Cl. 139-91.000.

Kabushiki Kaisha Mitsu Miike Seisakusho: *See*—
Iino, Fujio, 4,230,220, Cl. 198-509.000.

Kabushiki Kaisha Osaka Packing Seizosho: *See*—
Takahashi, Akira; and Takikawa, Toru, 4,230,765, Cl. 428-283.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Toyama, Akira, 4,231,072, Cl. 360-88.000.

Kabushiki Kaisha Toyota: *See*—
Komatsu, Noboru; Arai, Tohru; and Fujita, Hironori, 4,230,751, Cl. 427-443.100.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Obayashi, Mikio; and Watanabe, Naoyoshi, 4,230,507, Cl. 148-6.110.
Kadowaki, Hidejiro: *See*—
Aoki, Takao; Kadowaki, Hidejiro; and Iwami, Naoki, 4,230,783, Cl. 430-42.000.
Kaempfer, Gerhard P., to Wolverine World Wide, Inc. Material holddown. 4,230,055, Cl. 112-236.000.
Kagata, Tooru: *See*—
Goto, Hiromi; and Kagata, Tooru, 4,230,211, Cl. 192-35.000.
Kagetsu, Tadashi J.; De Atley, William B.; Fox, Joseph S.; and Malacarne, Oreste J., to Union Carbide Corporation. Recovery of Cr_2O_3 from a chromium bearing solution. 4,230,677, Cl. 423-54.000.
Kaim, John W., to AMSTED Industries Incorporated. Pin type solid butt rotary coupler. 4,230,228, Cl. 213-62.00A.
Kaiser Aluminum & Chemical Corporation: *See*—
Allen, Jim E.; and Farris, Robert E., 4,230,652, Cl. 264-30.000.
Kakutani, Kazuo: *See*—
Nojiri, Michihiko; Kakutani, Kazuo; Uedono, Shigezo; Uenakai, Kazuo; and Matsumoto, Masafumi, 4,230,806, Cl. 435-255.000.
Kalaf, George P.; and Henschen, Irvin C., to United States of America, Navy. Noise abating sleeve. 4,230,059, Cl. 114-20.00R.
Kalbfleish, Adolphe W. Combined ball and throttle valve. 4,230,154, Cl. 137-614.170.
Kalfoglou, George, to Texaco Inc. Method for treating subterranean, clay-containing earth formations. 4,230,183, Cl. 166-274.000.
Kali-Chemie Aktiengesellschaft: *See*—
Weidenbach, Guenter; and Bonse, Dirk, 4,230,803, Cl. 435-176.000.
Kali-Chemie Pharma GmbH: *See*—
Eckert, Theodor; and Kemper, Fritz H., 4,230,702, Cl. 424-242.000.
Kam-Lum, Elsa: *See*—
Maher, John P.; and Kam-Lum, Elsa, 4,230,754, Cl. 428-76.000.
Kamiya, Sadayoshi: *See*—
Yamauchi, Aizo; Matsuzawa, Yasuo; Kamiya, Sadayoshi; Nishioka, Keisuke; Hara, Yoshiaki; and Matsushima, Shogo, 4,230,690, Cl. 424-78.000.
Kanamaru, Masazi: *See*—
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.
Kanao, Shiro. Electroconductive hose for cleaner. 4,230,899, Cl. 174-47.000.
Kanayama, Toshiji: *See*—
Takayama, Toshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,230,800, Cl. 435-101.000.
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, to Bridgestone Tire Co., Ltd. Polyurethane tire filling material with plasticizer incorporated therein. 4,230,168, Cl. 152-310.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoneda, Koji; Ohashi, Takehisa; Nagamachi, Tomoaki; Fukumitsu, Hirotaka; and Takahashi, Satomi, 4,230,869, Cl. 548-314.000.
Kaneko, Shiro: *See*—
Nakamura, Hiroaki; Kaneko, Shiro; and Watanabe, Takeshi, 4,230,743, Cl. 427-146.000.
Kaneko, Yoichi: *See*—
Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, 4,231,116, Cl. 455-87.000.
Kaneto, Kimikazu: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,230,172, Cl. 164-192.000.
Kanetsu Kogyo Kabushiki Kaisha: *See*—
Nakajima, Takato, 4,230,560, Cl. 209-212.000.
Kansai Paint Company, Limited: *See*—
Yoshihara, Ichiro; Watanabe, Tadashi; and Iwase, Osamu, 4,230,829, Cl. 525-162.000.
Kao Soap Company, Limited: *See*—
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,230,725, Cl. 424-325.000.
Kaper, Louris: *See*—
Lustig, Klaus P.; and Kaper, Louris, 4,230,502, Cl. 106-314.000.
Kastl, Johann; and Schutz, Heinrich, to INTERATOM, International Atomreaktorbau GmbH. Mixing device for fluids of different and varying temperatures. 4,230,410, Cl. 366-177.000.
Katayama, Shigeru; and Aoki, Mutsuhiro, to Mitsui Petrochemical Industries Ltd. Process for producing hydrocarbon resins having improved color and thermal stability. 4,230,840, Cl. 526-77.000.
Katayama, Yoshihiko: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; Moriguchi, Kisoo; and Mizutani, Shigeru, 4,230,831, Cl. 525-240.000.
Katsube, Junki: *See*—
Maruyama, Isamu; Aono, Shunji; and Katsube, Junki, 4,230,706, Cl. 424-251.000.
Kauffman, William J.; and Lilley, George L., to Armstrong Cork Company. Process of forming an embossed surface covering. 4,230,759, Cl. 428-159.000.
Kawabata, Hidetoshi: *See*—
Murasaki, Hiroshi; Ogawa, Masaya; and Kawabata, Hidetoshi, 4,230,070, Cl. 118-658.000.
Kawabata, Kazuaki: *See*—
Fukuda, Takeo; and Kawabata, Kazuaki, 4,230,903, Cl. 370-24.000.
Kawabe, Yunosuke: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hatsishi, Osamu, 4,231,057, Cl. 357-50.000.
Kawamura, Yasutaro: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,230,172, Cl. 164-192.000.
Kawarada, Kuniyasu: *See*—
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.
Kawasaki, Keiji; and Matsuda, Itsuaki, to Showa Denko K.K. Cathode for electrolysis of aqueous solution of alkali metal halide. 4,230,543, Cl. 204-98.000.
Kawasaki, Motoo: *See*—
Kuga, Mutsuo; Kitagawa, Kiyoshi; Kawasaki, Motoo; and Watanabe, Junkichi, 4,230,654, Cl. 264-134.000.
Keefer, Bowie G. Rotary reverse osmosis apparatus and method. 4,230,564, Cl. 210-652.000.
Keegan, Robert R.: *See*—
Lemoine, Kenneth D.; and Keegan, Robert R., 4,230,530, Cl. 202-180.000.
Keene Corporation: *See*—
Haack, William M.; and Peth, Dennis K., 4,230,657, Cl. 264-234.000.
Keglewitsch, Josef, to Bunker Ramo Corporation. Electrical contact. 4,230,391, Cl. 339-97.00R.
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Verbrugge, Pieter A.; Kramer, Petrus A.; Van Berkel, Johannes; and Kelderman, Hendrik C., 4,230,891, Cl. 568-591.000.
Keller, Robert L., to J. J. Keller & Associates, Inc. Placard holding device. 4,229,891, Cl. 40-17.000.
Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,229,872, Cl. 29-420.000.
Kemper, Fritz H.: *See*—
Eckert, Theodor; and Kemper, Fritz H., 4,230,702, Cl. 424-242.000.
Kenmochi, Hirohito: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,230,852, Cl. 544-189.000.
Kenner, Allen L.: *See*—
Heap, David L.; and Kenner, Allen L., 4,231,106, Cl. 364-900.000.
Kerbleski, Joseph J.: *See*—
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,230,707, Cl. 424-251.000.
Kern, Fred R.: *See*—
Ward, Michael A. V.; and Kern, Fred R., 4,230,448, Cl. 431-208.000.
Kernforschungszentrum Karlsruhe, GmbH: *See*—
Donnert, Dietfried; and Eberle, Siegfried, 4,230,565, Cl. 210-683.000.
Kessl, Werner. Process for producing cast iron. 4,230,490, Cl. 75-130.00B.
Keystone International, Inc.: *See*—
Hall, George R., 4,229,907, Cl. 49-362.000.
Kharitonov, Jury P.: *See*—
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.
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Khoobiar, Sargis, to Halcon International, Inc. Process for the preparation of acrolein and methacrolein. 4,230,640, Cl. 568-477.000.
Kidd, Robert P.: *See*—
Booth, Jack J.; Branch, William C.; and Kidd, Robert P., 4,230,147, Cl. 137-504.000.
Kieferle, Hermann: *See*—
Junginger, Klaus M.; and Kieferle, Hermann, 4,231,019, Cl. 340-171.00R.
Kieffe, Patrick W.: *See*—
Brothers, Gene A.; Neely, John A.; and Kieffe, Patrick W., 4,230,913, Cl. 179-18.0FC.
Kilty, Michael; and Pernigotti, Allan, to AMF Incorporated. Cartridge filter and method of making same. 4,230,573, Cl. 210-767.000.
Kim Lighting, Inc.: *See*—
Compton, Wayne W., 4,231,080, Cl. 362-298.000.
Kimura, Akira: *See*—
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,230,087, Cl. 123-193.0CH.
Kimura, Fumio: *See*—
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, 4,230,481, Cl. 71-92.000.
King, Christopher J. H., to Monsanto Company. Pretreatment of cathodes in electrohydrodimerization of acrylonitrile. 4,230,541, Cl. 204-73.00A.
King, David P.: *See*—
Barker, Robert I; King, David P.; and Rice, Patrick F., 4,229,970, Cl. 73-56.000.
King, George W.: *See*—
Gardella, John F., Jr.; King, George W.; Kolm, Eric A.; and Kolm, Henry H., 4,230,978, Cl. 318-687.000.
King, Harry A.: *See*—
Gordon, Robert; Weingart, Oscar; King, Harry A.; and Springrose, James V., 4,230,048, Cl. 105-248.000.

King, William R. Brake control apparatus for railway cars. 4,230,374, Cl. 303-22.00R.
Kingston, William. Power take-off. 4,229,980, Cl. 74-15.630.
Kinoshita, Teruo: *See*—
Mizutani, Nagao; Kurihara, Toshio; Nishiyama, Yutaka; Kunita, Masao; Kinoshita, Teruo; and Yasunaga, Makoto, 4,230,039, Cl. 101-93.170.
Kintopf, Siegfried; and Kress, Ulrich, to Ciba-Geigy Corporation. Process for the production of 2-aryl-2H-benzotriazoles. 4,230,867, Cl. 548-260.000.
Kiriyama, Toshikatsu; and Hasegawa, Yoshiro, to Hitachi, Ltd. Switching matrix equipment having a series circuit of relay coil and self-holding diode at each crosspoint. 4,231,017, Cl. 340-166.00R.
Kistrup, Holger: *See*—
von Benda, Klaus; and Kistrup, Holger, 4,230,778, Cl. 429-104.000.
Kitagawa, Kiyoshi: *See*—
Kuga, Mutsuo; Kitagawa, Kiyoshi; Kawasaki, Motoo; and Watanabe, Junkichi, 4,230,654, Cl. 264-134.000.
Kitanishi, Mitsuo: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.
Kivits, Petrus J.: *See*—
de Bont, Marinus R. J.; Kivits, Petrus J.; Schoot, Cornelis J.; and Zalm, Pieter, 4,230,939, Cl. 235-488.000.
Klasing Industries, Inc.: *See*—
Williams, Clifford C., 4,230,347, Cl. 285-119.000.
Klaus, Michael J.; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Polyene compounds. 4,230,872, Cl. 549-62.000.
Klee, David J., to Air Products and Chemicals, Inc. Cryogenic freezer. 4,229,947, Cl. 62-374.000.
Klein, Gerhart P., to Emhart Industries, Inc. Method for applying material to a substrate. 4,230,742, Cl. 427-79.000.
Kleipool, Reinerus J. C., to Naarden International, N.V. Flavoring with 4-methyl-4-furfurylthio-pentanone-2. 4,230,734, Cl. 426-535.000.
Klett, Stanley D., to Xerox Corporation. Cleaning system for an electrostatic copier. 4,230,406, Cl. 355-15.000.
Kli, Inc.: *See*—
Watson, Trevor F., 4,230,116, Cl. 128-303.00A.
KMS Fusion, Inc.: *See*—
Gomberg, Henry J.; Lewis, John G.; and Powers, John E., 4,229,942, Cl. 60-644.000.
Knaub, Edgar W.: *See*—
Connolly, Arlene D.; Eshleman, James M.; and Knaub, Edgar W., 4,230,605, Cl. 252-545.000.
Knauer, Karl, to Siemens Aktiengesellschaft. Regenerator circuit for CCD arrangements in a multi-layer metallization structure. 4,230,952, Cl. 307-221.00D.
Knauer, Karl; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Transversal filter having parallel inputs. 4,231,002, Cl. 333-165.000.
Kneifel, Jerome J.; and Veburg, John C., to Dale Electronics, Inc. Method and means for testing the flammability of combustible materials. 4,229,967, Cl. 73-15.00R.
Knoerr, Karlheinz: *See*—
Noll, Erwin; and Knoerr, Karlheinz, 4,230,001, Cl. 81-9.220.
Knoll, Hartwig; Hogg, Klaus; and Laudenberg, Hermann, to Motoren- und Turbinen-Union Munchen GmbH. Arrangement for electromechanical axial clearance measurement. 4,229,884, Cl. 33-174.00L.
Knoor, Walter: *See*—
Heller, Wilhelm; Knoor, Walter; and Schweitzer, Reinhard, 4,230,488, Cl. 75-123.00F.
Knudsen, David S. Machine for installing inserts in container lids. 4,230,028, Cl. 93-1.300.
Kobashi, Takashi, to Mitutoyo Mfg. Co., Ltd. Measuring instrument with digital display. 4,229,883, Cl. 33-143.00L.
Kobayashi, Hiroto; and Hashimoto, Tsuneo, to Walbro Far East, Inc. Fuel feed system. 4,230,146, Cl. 137-494.000.
Kobayashi, Masahiro: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,230,525, Cl. 162-164.00R.
Kobayashi, Yoshinori: *See*—
Iwasaki, Hajime; Mizuta, Kuninori; Kobayashi, Yoshinori; Yoshikawa, Tadayoshi; and Muraoka, Kyouzi, 4,230,762, Cl. 428-234.000.
Kobe Steel, Limited: *See*—
Asari, Akira; Ueda, Masakazu; and Nishimoto, Takeo, 4,230,661, Cl. 264-323.000.
Kockums Industri Aktiebolag: *See*—
Edstrom, Soren E. H., 4,230,379, Cl. 308-187.000.
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, to Toyama Chemical Co., Ltd. Novel 2-[4-(3-methyl-2-thienyl)phenyl]-propionic acid and pharmaceutically acceptable salt thereof and method for treating symptoms of inflammation and pain. 4,230,719, Cl. 424-275.000.
Kodama, Yutaka: *See*—
Horike, Masanori; Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,231,048, Cl. 346-140.00R.
Iwasaki, Kyuhachiro; Kodama, Yutaka; Jinnai, Koichiro; and Horike, Masanori, 4,231,047, Cl. 346-75.000.
Koehler, David P.: *See*—
Meyer, Donald E.; Colpaert, James J.; Fischer, Frederick R.; Gatt, Michael E.; and Koehler, David P., 4,230,252, Cl. 228-152.000.
Kofman, Anatoli: *See*—
Schneerson, Moshe; and Kofman, Anatoli, 4,229,957, Cl. 70-134.000.
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for internal combustion engines. 4,230,079, Cl. 23-568.000.
Kohn, Jean: *See*—
Roberts, William M.; and Kohn, Jean, 4,230,061, Cl. 114-74.00A.
Kojima, Noriatsu. Method of connecting pipes and flanged pipe joints used therein. 4,229,923, Cl. 52-741.000.
Kolb, Gunter: *See*—
Tork, Leo; Kolb, Gunter; and Hohne, Wolfgang, 4,230,812, Cl. 526-320.000.
Kolb, Karl H.: *See*—
Schopflin, Gisela; Fuchs, Peter; and Kolb, Karl H., 4,230,686, Cl. 424-22.000.
Kolm, Eric A.: *See*—
Gardella, John F., Jr.; King, George W.; Kolm, Eric A.; and Kolm, Henry H., 4,230,978, Cl. 318-687.000.
Kolm, Henry H.: *See*—
Gardella, John F., Jr.; King, George W.; Kolm, Eric A.; and Kolm, Henry H., 4,230,978, Cl. 318-687.000.
Kolpakov, Serafim V.: *See*—
Sharonov, Mikhail A.; Zainullin, Lik A.; Olginsky, Felix Y.; Scherbakov, Ivan I.; Kolpakov, Serafim V.; and Teder, Leonid I., 4,230,477, Cl. 65-141.000.
Komatsu, Michiyasu: *See*—
Nakamura, Kiyoshi; Komatsu, Michiyasu; and Nakanishi, Masae, 4,230,494, Cl. 106-14.050.
Komatsu, Noboru; Arai, Tohru; and Fujita, Hironori, to Kabushiki Kaisha Toyota; and Chuo Kenkyusho. Treating composition, forming a mixed-carbide layer of Va-Group elements and of chromium on a ferrous-alloy surface and resulting product. 4,230,751, Cl. 427-443.100.
Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto, 4,230,429, Cl. 408-186.000.
Komoto, Mikihisa: *See*—
Oshima, Masanao; Komoto, Mikihisa; Yabuki, Shoichi; and Inokawa, Tsuneo, 4,230,423, Cl. 405-211.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Watanabe, Shotaro; Tozawa, Katsutoshi; and Uetake, Shigeru, 4,230,787, Cl. 430-107.000.
Koppers Company, Inc.: *See*—
Harris, Edward, 4,230,532, Cl. 202-248.000.
Korbilas, Christ P.: *See*—
Billington, Evans R.; Batka, Robert J.; and Korbilas, Christ P., 4,230,161, Cl. 141-302.000.
Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 1-And/or 7-substituted-6-hydroxy (or oxo)-3-decahydroquinoline carboxylic acids. 4,230,861, Cl. 546-164.000.
Korwin, Paul; and Cohen, Eric S., to Cose Technology Corporation. System for and method of indicating intruder presence on telephone lines, and method of installation of telephone intruder alarm system. 4,230,914, Cl. 179-81.00E.
Kosaka, Takao, to Mitsubishi Paper Mills, Ltd. Thermosensitive recording paper improved in printing quality. 4,230,776, Cl. 428-537.000.
Kosek, Jiri: *See*—
Spacek, Jindrich; and Kosek, Jiri, 4,229,965, Cl. 72-453.130.
Koseki, Shosaku: *See*—
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.
Kosswig, Kurt: *See*—
Coenen, Alfred; Kosswig, Kurt; Hentschel, Bernhard; and Ziebarth, Jurgen, 4,230,681, Cl. 423-481.000.
Kostka, Hana: *See*—
Berg, Hermann O.; Gulden, Peter; Kostka, Hana; and Michel, Alfred, 4,230,443, Cl. 431-328.000.
Kosugi, Hiroshi; Inoue, Hirofumi; and Shirasu, Hirotoshi, to Hitachi, Ltd. Interpolative PCM decoder utilized for μ-law and A-law. 4,231,022, Cl. 340-347.0DA.
Koszi, Louis A.: *See*—
Hartman, Robert L.; Ilegems, Marc; Koszi, Louis A.; and Wagner, Wilfried R., 4,230,997, Cl. 331-94.50H.
Kotick, Michael P.; Schut, Robert N.; Polazzi, Joseph O.; and Leland, David L., to Miles Laboratories, Inc. 7-Methyl-8β-lower alkyl or 7-methyl-8-lower alkyl B/C cis or trans morphinan-6-one compounds and therapeutic method of treating pain employing them. 4,230,712, Cl. 424-260.000.
Kotski, Edward J., to Amerace Corporation. Flexible electrical connector assembly. 4,230,389, Cl. 339-75.00M.
Koumura, Suketsugu: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,230,852, Cl. 544-189.000.
Kouyama, Susumu: *See*—
Suzuki, Yasoji; and Kouyama, Susumu, 4,230,951, Cl. 307-200.00B.
Kowall, James L.; and Taylor, Paul M., to Powerpak, Inc. Shipping container. 4,230,227, Cl. 206-600.000.
Koyo Jidoki Co., Ltd.: *See*—
Yamashita, Kyoichi, 4,230,516, Cl. 156-364.000.

Kozuma, Akiyoshi: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, 4,230,658, Cl. 264-235.800.

Kramer, Petrus A.: *See*—
Verbrugge, Pieter A.; Kramer, Petrus A.; Van Berkel, Johannes; and Kelderman, Hendrik C., 4,230,891, Cl. 568-591.000.

Kramer, Robert G., to Diamond International Corporation. Foldable protective packaging sleeve or carton. 4,230,260, Cl. 229-39.00B.

Kraus, Peter: *See*—
Oeckl, Siegfried; Scheinpflug, Hans; and Kraus, Peter, 4,230,723, Cl. 424-302.000.

Krause, Donald. Multipart photosensitive element with both fixed contrast and variable contrast part records. 4,230,795, Cl. 430-503.000.

Kress, Ulrich: *See*—
Kintopf, Siegfried; and Kress, Ulrich, 4,230,867, Cl. 548-260.000.

Kretzinger, Karl F., to Garrett Corporation, The. Apparatus for reinforcement of thin plate, high pressure fluid heat exchangers. 4,229,868, Cl. 29-157.30R.

Kriegler, Franz. Steam engine. 4,229,943, Cl. 60-652.000.

Kruckel, Peter; and Winkler, Wolfgang, to Messrs. Schwan-Stabilo Schwanhausser GmbH & Co. Pencils. 4,230,655, Cl. 264-135.000.

Krueger, Achim R.: *See*—
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,230,844, Cl. 526-210.000.

Krueger, Gottfried J., to European Atomic Energy Community. Coil for the production of homogeneous magnetic fields. 4,231,008, Cl. 335-209.000.

Krutsch, John R.: *See*—
Barlow, Gordon A.; and Krutsch, John R., 4,230,314, Cl. 273-1.00E.

Kubelka, Axel: *See*—
Kubelka, Axel R., 4,229,862, Cl. 24-68.0SK.

Kubelka, Axel R., to Weigl, Erwin; and Kubelka, Axel. Strap tensioning buckle. 4,229,862, Cl. 24-68.0SK.

Kuboyama, Morio: *See*—
Nishida, Masayuki; Funakoshi, Satoshi; Ogasa, Katsuhiro; Kuboyama, Morio; Yanai, Nobuya; and Yamada, Muneo, 4,230,697, Cl. 424-177.000.

Kudo, Kesayoshi: *See*—
Yoshida, Kiyotaka; Hatanaka, Yoshio; Kudo, Kesayoshi; and Aoki, Takao, 4,230,735, Cl. 426-557.000.

Kudra, Anthony J., III. Roofing aid. 4,230,202, Cl. 182-45.000.

Kuebler, Gary R.: *See*—
Schantz, Spencer C.; and Kuebler, Gary R., 4,230,919, Cl. 200-67.00B.

Kuga, Mutsuo; Kitagawa, Kiyoshi; Kawasaki, Motoo; and Watanabe, Junkichi, to Unitika Limited. Method of concurrently-biaxially drawing polyvinyl alcohol film. 4,230,654, Cl. 264-134.000.

Kumagae, Kimitaka: *See*—
Itoh, Kunio; and Kumagae, Kimitaka, 4,230,815, Cl. 526-335.000.

Kumai, Teruo: *See*—
Nohira, Hidetaka; Ito, Sumio; Oki, Hisashi; and Kumai, Teruo, 4,230,073, Cl. 123-308.000.

Kunita, Masao: *See*—
Mizutani, Nagao; Kurihara, Toshio; Nishiyama, Yutaka; Kunita, Masao; Kinoshita, Teruo; and Yasunaga, Makoto, 4,230,039, Cl. 101-93.170.

Kunzmann, Otto, to Bielomatik Leuze & Co. Apparatus for transporting layers of sheets. 4,230,218, Cl. 198-461.000.

Kuo, Chang-Kiang, to Texas Instruments Incorporated. Method of making implant programmable N-channel ROM. 4,230,504, Cl. 148-1.500.

Kurihara, Toshio: *See*—
Mizutani, Nagao; Kurihara, Toshio; Nishiyama, Yutaka; Kunita, Masao; Kinoshita, Teruo; and Yasunaga, Makoto, 4,230,039, Cl. 101-93.170.

Kurokawa, Koji: *See*—
Iwamoto, Taro; Ando, Shimon; Kurokawa, Koji; and Kusumoto, Sho, 4,230,067, Cl. 118-104.000.

Kurpanek, Waldemar H. Hydro-thermic energy converter. 4,230,963, Cl. 310-306.000.

Kurtz, Clark N., to Eastman Kodak Company. Electronic imaging apparatus using multicolor electrophotosensitive particles. 4,230,405, Cl. 355-4.000.

Kurz, Milton. Thermal insulating material. 4,230,057, Cl. 112-420.000.

Kushner, Gerald J.: *See*—
Wendt, Michael E.; and Kushner, Gerald J., 4,229,869, Cl. 29-157.400.

Kusniruk, Vladimir F.: *See*—
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.

Kusumoto, Sho: *See*—
Iwamoto, Taro; Ando, Shimon; Kurokawa, Koji; and Kusumoto, Sho, 4,230,067, Cl. 118-104.000.

La Crosse Cooler Company, Inc.: *See*—
Spring, Carl E., 4,230,213, Cl. 194-1.00K.

La Telemecanique Electrique: *See*—
Thierry, Jean-Pierre; Debionne, Alain; and Nourry, Daniel, 4,230,388, Cl. 339-74.00R.

Laauwe, Robert H. Dispensing valve particularly for viscous products and having a dome-shaped applicator. 4,230,240, Cl. 222-212.000.

Labofina, S.A.: *See*—
Bertrand, Jean-Noel M., 4,230,821, Cl. 521-95.000.

Lagerwerf, Harry: *See*—
Braat, Antonius M. M.; and Lagerwerf, Harry, 4,230,178, Cl. 165-76.000.

L'Air Liquide S.A. pour l'Etude et l'Exploitation des Procedes George Claude: *See*—
Zumbrunn, Jean-Pierre, 4,230,478, Cl. 71-3.000.

Lambert, William H.: *See*—
Johnson, Aldus, 4,230,329, Cl. 280-43.170.

Lamondine S.A.: *See*—
Sparkes, Curtis A., 4,229,856, Cl. 16-47.000.

Lancashire Box Company, Limited: *See*—
Lane, Douglas C., 4,230,258, Cl. 229-30.000.

Lane, Douglas C., to Lancashire Box Company, Limited. Tray for a shrink-wrap package. 4,230,258, Cl. 229-30.000.

Langen, Marinus J. M.; and Strauss, Edgars H., to H. J. Langen & Sons Limited. Checkout counter with bag delivery means. 4,230,204, Cl. 186-66.000.

Lanter, Kent J.: *See*—
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,230,736, Cl. 426-601.000.

Larbig, Wolfgang, to Bayer Aktiengesellschaft. Process for working up effluents containing nitro-hydroxy-aromatic compounds. 4,230,567, Cl. 210-600.000.

Larsen, Christian; Frederiksen, Per D.; and Sorensen, Ebbe N., to Wavin B.V. Pipe having an end portion, the inner wall of which is provided with a circumferential groove, in which a sealing means is mounted and a pipe joint consisting of this pipe and a spigot end of a second pipe inserted therein. 4,230,157, Cl. 138-155.000.

Larson, Lary R., to Medtronic, Inc. Cardiac monitoring apparatus. 4,230,127, Cl. 128-706.000.

Lascelles, Daniel J., to McDonnell Douglas Corporation. Circuit board wire bonding and cutting apparatus. 4,230,925, Cl. 219-56.100.

Lathrop Paulson Company: *See*—
DuBroff, Warren, 4,230,519, Cl. 156-468.000.

Lattime, Richard R., to Goodyear Tire & Rubber Company, The. Method of preparing resin. 4,230,810, Cl. 526-224.000.

Lauck, Robert M., to Stauffer Chemical Company. Leavening acid composition. 4,230,730, Cl. 426-128.000.

Laudenberg, Hermann: *See*—
Knoll, Hartwig; Hogg, Klaus; and Laudenberg, Hermann, 4,229,884, Cl. 33-174.00L.

Laughlin, William F. Take-apart convertible rotary tool. 4,229,912, Cl. 51-335.000.

Laurel Bank Machine Co., Ltd.: *See*—
Ueda, Nobuo, 4,230,135, Cl. 133-3.00D.

LaVance, Cecil N.; and Beale, Allan A., to Motorola, Inc. Method of returning to a last point in a path after a temporary discontinuance of an operation. 4,231,093, Cl. 364-460.000.

Lavanish, Jerome M., to PPG Industries, Inc. 3-[5-(1-(Nitrophenoxy)alkyl, alkynyl, alkenyl, or haloalkyl)-1,3,4-thiadiazol-2-yl]-4-hydroxy-1-methyl-2-imidazolidinones. 4,230,480, Cl. 71-90.000.

Lawrence, David K.: *See*—
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., 4,230,484, Cl. 71-111.000.

Lawson, Charles M.: *See*—
Tulis, Milton A.; Lawson, Charles M.; and Whiting, Lawrence D., III, 4,230,509, Cl. 149-109.400.

Layeillon, Jacques, to Simmonds, S.A. Skirted nut. 4,230,166, Cl. 151-7.000.

Lear Siegler, Inc.: *See*—
Potter, Gene B.; and Jurick, Martin H., 4,230,970, Cl. 315-307.000.

LeBlanc, Joseph R.: *See*—
Becker, Colman L.; and LeBlanc, Joseph R., 4,230,680, Cl. 423-360.000.

Le Corre, Maurice; Hercouet, Alain; and Begasse, Beatrice, to Agence Nationale de Valorisation de la Recherche. Process for the synthesis of derivatives of the benzofuran, chromene and isochromene type. 4,230,624, Cl. 260-345.200.

Lee, David Q.; and Rovnyak, Richard M., to GTE Automatic Electric Laboratories Incorporated. Dial pulse sensor and repeater circuit. 4,230,912, Cl. 179-16.0EA.

Lee, Joseph Y.: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; and Sentisi, Joseph C., 4,230,549, Cl. 204-159.170.

Lee, Tzuo-Chang: *See*—
Forss, John A.; and Lee, Tzuo-Chang, 4,230,950, Cl. 250-574.000.

Lee, Wha S. Process for preparing 5,6-dihydro-2-methyl-1,4-oxathiin derivatives. 4,230,871, Cl. 549-14.000.

Lee, Yu-Sun; and Shackle, Dale R., to Mead Corporation, The. Process for producing a pressure-sensitive carbonless copy sheet using microcapsules formed in situ in a radiation curable binder. 4,230,495, Cl. 106-14.500.

Leeuwrik, Frederik H., to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzcek Ten Behoeve Van Nijverheid, Handel en Verkeer (Nijverheidsorganisatie T.N.O.). Rotor adapted to rotate about a rotary shaft. 4,230,648, Cl. 261-87.000.

LeFever, Randall H., to GTE Products Corporation. Intrusion alarm safety. 4,230,450, Cl. 431-361.000.

Lega-Norm AG: *See*—
Henggeler-Achermann, Josy, 4,230,310, Cl. 269-316.000.

Legueu, Paul E. R. Highly autonomous cross-country workshop and servicing van. 4,230,358, Cl. 296-24.00R.

Lehmann, Wilfried; Muller, Hermann; and Baranek, Bodo, to Sihi GmbH & Co. KG. Rotary pump assembly. 4,230,438, Cl. 415-122.00R.
Leiber, Heinz, to Robert Bosch GmbH. Anti-skid braking system. 4,230,375, Cl. 303-105.000.
Leichnitz, Kurt, to Dragerwerk Aktiengesellschaft. Apparatus and method for measuring aerosols and gases with detector tubes. 4,230,457, Cl. 23-232.00R.
Leigh, Theodore M.; and Rawson, James L., to Highway Equipment Company. Vehicular spreader with digital electronic ground speed link. 4,230,280, Cl. 239-677.000.
LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o.: *See*—
Rucman, Rudolf, 4,230,859, Cl. 546-69.000.
Zupancic, Boris; and Sopoic, Mirko, 4,230,884, Cl. 562-460.000.
Leland, David L.: *See*—
Kotick, Michael P.; Schut, Robert N.; Polazzi, Joseph O.; and Leland, David L., 4,230,712, Cl. 424-260.000.
Lemaire, Francis: *See*—
Gaussens, Gilbert; Lemaire, Francis; and Van Nguyen, Bach, 4,230,766, Cl. 428-288.000.
Lemoine, Kenneth D.; and Keegan, Robert R., to Lemoine, Kenneth D. Self-cleaning water distiller with intermittent overflow. 4,230,530, Cl. 202-180.000.
Lenco, Inc.: *See*—
Blair, Bruce A.; and McClure, Howard G., 4,230,929, Cl. 219-111.000.
Lendvai, Imre: *See*—
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Orban, Jozsef, 4,230,020, Cl. 91-422.000.
Lenk, Erich; and Dobbins, Donald J., to Barmag Barmer Maschinenfabrik AG. Traversing device for thread winding apparatus. 4,230,285, Cl. 242-43.00R.
Lents, Charles M., to Church's Fried Chicken, Inc. Apparatus for basting and displaying foods. 4,230,066, Cl. 118-20.000.
Leonard, Robert D., Jr.; and Nestor, Charles R., to General Motors Corporation. Electrical socket connector. 4,230,392, Cl. 339-117.00R.
Leonov, Ivan P.: *See*—
Svirschevsky, Valentin K.; Trofimuk, Andrei A.; Vasiliev, Gennady G.; and Leonov, Ivan P., 4,230,191, Cl. 175-20.000.
Le Page, Jean-Francois: *See*—
Cosyns, Jean; Stern, Robert; and Le Page, Jean-Francois, 4,230,897, Cl. 585-260.000.
Lermann, Peter: *See*—
Wick, Richard; Stemme, Otto; Lermann, Peter; Wagner, Karl; Borowski, Kurt; Cocron, Istvan; and Fauth, Gunter, 4,230,400, Cl. 354-25.000.
Lert, John G., Jr.; Lert, Peter W.; and Cornelius, John F. Broadcast program identification method and system. 4,230,990, Cl. 455-67.000.
Lert, Peter W.: *See*—
Lert, John G., Jr.; Lert, Peter W.; and Cornelius, John F., 4,230,990, Cl. 455-67.000.
Levecque, Marcel; and Battigelli, Jean A., to Saint-Gobain Industries. Suppression of pollution in mineral fiber manufacture. 4,230,471, Cl. 65-2.000.
LeVeen, Harry H. Radio frequency, electromagnetic radiation device having orbital mount. 4,230,129, Cl. 128-804.000.
Lever Brothers Company: *See*—
Heider, Henning; and Wieske, Theophil, 4,230,737, Cl. 426-607.000.
Lewine, Donald A.; Dundon, Thomas M.; and Setera, Ronald J., to Digital Equipment Corporation. Data processing system with apparatus for correcting microinstruction errors. 4,231,089, Cl. 364-200.000.
Lewis, David O.: *See*—
Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., 4,231,088, Cl. 364-200.000.
Lewis, Harry R., Jr., to Standard Oil Company (Indiana). Simplified subsea production wellhead. 4,230,186, Cl. 166-342.000.
Lewis, John G.: *See*—
Gomberg, Henry J.; Lewis, John G.; and Powers, John E., 4,229,942, Cl. 60-644.000.
Lewis, Robert B.: *See*—
Campo, Edgar A.; and Lewis, Robert B., 4,229,861, Cl. 19-161.100.
Leybold-Heraeus GmbH: *See*—
Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, 4,230,739, Cl. 427-42.000.
Leyerzapf, Manfred: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,230,907, Cl. 179-1.00E.
Li, Yao T. Distillation apparatus. 4,230,529, Cl. 202-175.000.
Libbey-Owens-Ford Company: *See*—
Genson, Charles W., 4,230,257, Cl. 228-244.000.
Likhosherstov, Arkady M.: *See*—
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; and Peresada, Vitaly P., 4,230,856, Cl. 544-349.000.
Lilley, George L.: *See*—
Kauffman, William J.; and Lilley, George L., 4,230,759, Cl. 428-159.000.
Lilly Industries Limited: *See*—
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,709, Cl. 424-256.000.
Linde Aktiengesellschaft: *See*—
Grimm, Peter; and Burr, Peter, 4,230,469, Cl. 62-28.000.
Lindebrings, Charles M. P.; Vaillagou, Pierre; and Velte, Andre J. F., to Societe Anonyme de Telecommunications. Manufacture of printed circuit boards. 4,229,879, Cl. 29-840.000.
Lindgren, Bo S.: *See*—
Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., 4,230,040, Cl. 102-13.000.
Lindmayer, Joseph, to Solarex Corporation. Method of making semicrystalline silicon article. 4,230,508, Cl. 148-186.000.
Lindner, Max E. Putting stroke practice device. 4,230,319, Cl. 273-192.000.
Lindova Aktiebolag: *See*—
Nilsson, Sven R., 4,229,960, Cl. 72-114.000.
Ling, Chung-Mei: *See*—
Decker, Richard H.; Ling, Chung-Mei; and Overby, Lacy R., 4,230,683, Cl. 424-1.000.
LIPHA, Lyonnaise Industrielle Pharmaceutique: *See*—
Briet, Philippe; Berthelon, Jean-Jacques; and Depin, Jean-Claude, 4,230,850, Cl. 544-151.000.
Lipp, Alfred: *See*—
Schwetz, Karl A.; and Lipp, Alfred, 4,230,497, Cl. 106-44.000.
Lister Bolt & Chain Ltd.: *See*—
White, Leonard D., 4,230,326, Cl. 277-166.000.
Litton Industrial Products Inc.: *See*—
Reimers, Robert, 4,230,453, Cl. 433-29.000.
Liu, Kou-Chang; and Howe, Robert K., to Monsanto Company. Preparation of 3-aryl-isoxazol-5-yl-benzoic acid and salts thereof. 4,230,866, Cl. 548-247.000.
Lizee, Dominique, to Rhone-Poulenc Industries. Uniform distribution of a liquid over a filter surface. 4,230,575, Cl. 210-780.000.
Lococo, Michael P. Tooth extractor. 4,230,454, Cl. 433-153.000.
Logan, Clifford K., Jr., to Burki, Arthur G.; and Wygant, Thomas G. Rotary drill bit. 4,230,193, Cl. 175-379.000.
Logan, Clifford K., Jr. Rotary drill bit. 4,230,194, Cl. 175-379.000.
Logemann Brothers Company: *See*—
Schmalz, Roman, 4,230,037, Cl. 100-95.000.
Lohr & Bromkamp GmbH: *See*—
Aucktor, Erich; and Rubin, Wolfgang, 4,229,952, Cl. 64-21.000.
Lohrberg, Karl; Pfohl, Rainer; Schubert, Jurgen; and Gritschke, Martin, to Metallgesellschaft Aktiengesellschaft. Method and apparatus for supplying dissolved chemicals into water. 4,230,569, Cl. 210-754.000.
Lombardi, Paolo: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, 4,230,619, Cl. 260-239.00A.
Lombardo, Ralph M., Jr.: *See*—
Tarbox, Bruce H.; Bruce, Kenneth E.; Conway, John W.; and Lombardo, Ralph M., Jr., 4,231,086, Cl. 364-200.000.
Long, Maurice W. Radar clutter suppressor. 4,231,037, Cl. 343-5.0CE.
Loop-A-Line, Inc.: *See*—
McGahee, Welbourne D., 4,229,899, Cl. 43-42.090.
Lord Corporation: *See*—
Schwemmer, Leonard J., 4,229,839, Cl. 3-1.910.
Losert, Ewald; and Rembold, Heinz, to Ciba-Geigy Corporation. Process for the production of solder masks for printed circuits. 4,230,793, Cl. 430-315.000.
Loughlin, Bernard T.: *See*—
Sandman, Michael A.; and Loughlin, Bernard T., 4,230,461, Cl. 51-295.000.
Lount, William D., to Frank R. Lount & Son (1971) Ltd. Foamed plastic concrete form and connectors therefor. 4,229,920, Cl. 52-309.120.
Loveless, Wendell G.: *See*—
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.
Lovret, John E. Fuel drip priming system for cold internal combustion engines. 4,230,086, Cl. 123-187.50R.
Lowe, Gerald W. Combination foldable golf club carrier and score keeping device. 4,230,247, Cl. 224-45.00R.
Lowther, Frank E., to Purification Sciences Inc. Internal combustion engine. 4,230,075, Cl. 123-68.000.
LRS Research: *See*—
Taylor, Lauren P.; and Petroski, Alex, 4,230,676, Cl. 422-62.000.
Lubbers, Dietrich W.; and Huch, Albert, to Max Planck Gesellschaft fuer Foerderung der Wissenschaften. Transcutaneous monitoring of critical perfusion-efficiency situations. 4,230,122, Cl. 128-635.000.
Lubrizol Corporation, The: *See*—
Bretz, John; and Cech, Leonard S., 4,230,586, Cl. 252-8.50P.
Coleman, Lester E., 4,230,843, Cl. 526-204.000.
Lucas Industries Limited: *See*—
Sharpe, Raymond, 4,229,986, Cl. 74-200.000.
Smith, Trevor S., 4,229,937, Cl. 60-39.28R.
Smith, Trevor S., 4,229,939, Cl. 60-243.000.
Lucas, Raymond D. Building structures. 4,229,914, Cl. 52-63.000.
Lukits, John J. Universal electrical construction set. 4,229,887, Cl. 35-19.00A.
Lustig, Klaus P.; and Kaper, Louris, to Akzona Incorporated. Building material additive. 4,230,502, Cl. 106-314.000.
Mabry, Vern D., Jr. Cantilevered medial trailer. 4,230,334, Cl. 280-415.00R.
Mack, Bernard. Universal T.V. channel knob. 4,230,064, Cl. 116-245.000.
Mack, Walter E.: *See*—
Tinder, David V.; and Mack, Walter E., 4,230,276, Cl. 239-229.000.
Macky, Barry L., to Milwaukee Electric Tool Corporation. Reversible hammer drill. 4,229,981, Cl. 74-56.000.

Maeda, Hiroaki: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,229,998, Cl. 74-865.000.
Maeda, Masato: *See*—
Sano, Seisuke; Maeda, Masato; and Iguchi, Morimichi, 4,230,555, Cl. 204-195.00S.
Maejima, Masatsugu: *See*—
Saruwatari, Kohichi; Isawa, Kazuo; Maejima, Masatsugu; and Suzuki, Takao, 4,230,539, Cl. 204-35.00N.
Mag, Theodore K.; and Reid, Margaret P., to Canada Packers Limited. Continuous process and apparatus for adsorbent bleaching of triglyceride oils. 4,230,630, Cl. 260-428.000.
Magic Chef, Inc.: *See*—
Gee, James W.; and Arntz, Richard J., 4,230,350, Cl. 292-144.000.
Maher, John P.; and Kam-Lum, Elsa, to Sprague Electric Company. Bonding electronic component to molded package. 4,230,754, Cl. 428-76.000.
Mahler, Walter; and Forshey, William O., Jr., to Du Pont de Nemours, E. I., and Company. Poly(silicic acid). 4,230,679, Cl. 423-325.000.
Main, Kenneth G.: *See*—
Donatelli, Paul C.; and Main, Kenneth G., 4,230,975, Cl. 318-6.000.
Makino, Shigeo; Sugimura, Norboru; and Aoki, Shigeta, to Bridgestone Tire Co., Ltd. Center block side rib tread pattern for heavy vehicle radial tires. 4,230,512, Cl. 152-209.00R.
Malacarne, Oreste J.: *See*—
Kagetsu, Tadashi J.; De Atley, William B.; Fox, Joseph S.; and Malacarne, Oreste J., 4,230,677, Cl. 423-54.000.
Malerbi, Bernard W.: *See*—
Hydes, Paul C.; and Malerbi, Bernard W., 4,230,631, Cl. 260-429.00R.
Malherbe, Roger; Bellus, Daniel; and Gsell, Laurenz, to Ciba-Geigy Corporation. Dihalovinylcyclopropanethiolic acid esters and their use in pest control. 4,230,722, Cl. 424-301.000.
Mallinckrodt, Inc.: *See*—
Smith, Kenneth R., 4,230,845, Cl. 536-4.000.
Mann, Brian M.; and Beane, Russell R., to Pacesetter Systems, Inc. Battery monitoring means for an implantable living tissue stimulator. 4,231,027, Cl. 340-636.000.
Mannesmann Aktiengesellschaft: *See*—
Steinberg, Hans; and Sudhoff, Wolfgang, 4,229,990, Cl. 74-377.000.
Mano, Hiroshi, to Sumitomo Electric Industries, Ltd. Vascular prosthesis having a composite structure. 4,229,838, Cl. 3-1.400.
Marcault, Jeannik, to Saint-Gobain Industries. Apparatus for depositing a uniform thickness layer of particulate material. 4,230,271, Cl. 239-113.000.
Marconi Company Limited, The: *See*—
Hutchinson, Ronald, 4,231,001, Cl. 333-110.000.
Margolin, George D.; and Vurpillat, Victor V., to Centurion Data Corporation. Computer input/output device. 4,230,938, Cl. 235-441.000.
Margolin, George D.: *See*—
Bell, Vincent G., Jr.; Burke, Thomas P.; Margolin, George D.; and Vurpillat, Victor V., 4,230,344, Cl. 283-6.000.
Margotte, Dieter: *See*—
Adelmann, Siegfried; Margotte, Dieter; and Vernaleken, Hugo, 4,230,548, Cl. 204-159.140.
Mark, Victor; and Wilson, Phillip S., to General Electric Company. Silane plasticized polycarbonate composition. 4,230,611, Cl. 260-29.15B.
Markarian, Mark; and Meyer, Kenneth B., to Sprague Electric Company. Tantalum foil capacitor with strong acid electrolyte. 4,231,076, Cl. 361-433.000.
Marpal AG: *See*—
Degen, Hugo, 4,229,847, Cl. 5-481.000.
Marquez, Joseph A.: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,230,799, Cl. 435-76.000.
Marra, Dorothea C.: *See*—
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,230,243, Cl. 222-402.180.
Marshall II, John, deceased (by James, Richard N., agent), to United Technologies Corporation. Tuned spring-mass vibration absorber. 4,230,291, Cl. 244-17.110.
Marshall, John T.: *See*—
Sholl, Howard A.; and Marshall, John T., 4,229,978, Cl. 73-626.000.
Marten, Edward N., to H. B. Zachry Company. Dual rock cutter wheel trencher. 4,230,372, Cl. 299-39.000.
Martin, Eugene R., to SWS Silicones Corporation. Thiofunctional polysiloxane polymers. 4,230,816, Cl. 528-12.000.
Martin, Jerry R.: *See*—
Tadanier, John S.; and Martin, Jerry R., 4,230,846, Cl. 536-4.000.
Martin, John E.; and Ng, Wing P., to Rockwell International Corporation. PNAF Etchant for aluminum and silicon. 4,230,522, Cl. 156-638.000.
Martin Marietta Corporation: *See*—
Wells, Royzell F., 4,230,390, Cl. 339-90.00R.
Maruyama, Isamu; Aono, Shunji; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Antihypertensive quinazoline compounds. 4,230,706, Cl. 424-251.000.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Hicks, Alan A.; Jaworski, Eugene; and Meyer, Burton C., 4,230,317, Cl. 273-119.00A.
Morrison, Howard J.; and Wildman, John R., 4,229,903, Cl. 46-232.000.
Maschberger, Adolph; and August, Peter, to Wacker-Chemie GmbH. Process for the preparation of organopolysiloxane foams. 4,230,820, Cl. 521-77.000.
Mashimo, Toru, to Toyo Kogyo Co., Ltd. Drilled hole end adjusting arrangement. 4,230,189, Cl. 173-4.000.
Massa, Donald P.: *See*—
Massa, Frank, 4,231,112, Cl. 367-158.000.
Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P. High-power underwater transducer with improved performance and reliability characteristics and method for controlling said improved characteristics. 4,231,112, Cl. 367-158.000.
Massachusetts General Hospital, The: *See*—
Young, David M., 4,230,691, Cl. 424-85.000.
Massaro, James J.: *See*—
Dotschkal, Anton A.; and Massaro, James J., 4,230,267, Cl. 236-9.00A.
Masuda, Yoshiro: *See*—
Takayama, Toshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,230,800, Cl. 435-101.000.
Mathevet, Albert: *See*—
Boileau, Jacques; and Mathevet, Albert, 4,230,169, Cl. 152-353.00R.
MATRA: *See*—
Cassagne, Pierre, 4,231,095, Cl. 364-515.000.
Matrone, John L.; and Roberts, Robert D., to Fairchild Camera and Instrument Corporation. Fixturing system. 4,230,985, Cl. 324-158.00F.
Matsuda, Itsuaki: *See*—
Kawasaki, Keiji; and Matsuda, Itsuaki, 4,230,543, Cl. 204-98.000.
Matsuda, Toshiharu; Miyamoto, Seigo; and Minoshima, Yasuo, to Hitachi, Ltd. Air conditioning system. 4,230,470, Cl. 62-197.000.
Matsuda, Yasuo; Honda, Kazuo; and Muto, Nobuyoshi, to Hitachi, Ltd. Power conversion apparatus. 4,231,083, Cl. 363-135.000.
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, to Unitika Limited. Process for preparing biaxially drawn thermoplastic polyester film. 4,230,658, Cl. 264-235.800.
Matsumoto, Masafumi: *See*—
Nojiri, Michihiko; Kakutani, Kazuo; Uedono, Shigezo; Uenakai, Kazuo; and Matsumoto, Masafumi, 4,230,806, Cl. 435-255.000.
Matsumoto, Tetsuo, to Okumura, Akira; Yamada, Shigemitsu; and Uozumi, Fumiko. Method and apparatus for centrifugal separation of components of solution. 4,230,264, Cl. 233-27.000.
Matsuo, Maki: *See*—
Isaka, Tsutomu; Matsuo, Maki; and Miyazaki, Yukinobu, 4,230,767, Cl. 428-349.000.
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Saperstein, David D.; and Pines, Seemon H., 4,230,883, Cl. 562-445.000.
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Moreau, Jean R.; Pelletier, Martin P.; and Tremblay, Gerard B. Process for agglomerating particulate wood material and products obtained thereby. 4,230,459, Cl. 44-10.00B.
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Motorola, Inc.: *See*—
Bafaro, Michael P., 4,230,972, Cl. 315-382.000.
Bickley, Robert H.; and Dewey, Michael J., 4,230,973, Cl. 315-383.000.
Dolikian, Arman V., 4,231,114, Cl. 455-49.000.
Gatto, Donald F., 4,230,777, Cl. 429-97.000.
LaVance, Cecil N.; and Beale, Allan A., 4,231,093, Cl. 364-460.000.
Stauers, Juris, 4,231,099, Cl. 364-718.000.
Walker, Scott H., 4,231,040, Cl. 343-100.0SA.
Motz, Phillip R., to General Motors Corporation. Engine control system. 4,231,091, Cl. 364-431.000.
Mougin, Georges L., to ITI Limited. Thermal protective device for tabular icebergs. 4,230,418, Cl. 405-52.000.
Moyer, Joseph D., to W. R. Grace & Co. Heat stable, non-yellowing photopolymer compositions. 4,230,740, Cl. 427-54.100.
Moynihan, Robert E.: *See*—
Derick, Burton N.; Moynihan, Robert E.; and Wolfe, Jon W., 4,230,775, Cl. 428-525.000.
Moyroud, Louis M. Photocomposing machine and method. 4,230,399, Cl. 354-10.000.
MTD Products Inc: *See*—
Plamper, Gunter, 4,229,994, Cl. 74-552.000.
Mueller, Robert S., to Eaton Corporation. Control for valve disablers. 4,230,076, Cl. 123-90.160.
Mueller, Wolfgang H.: *See*—
Drake, William O.; Hinsken, Hans; Mayerhoefer, Horst; and Mueller, Wolfgang H., 4,230,857, Cl. 544-388.000.
Muhammad, Clifton C., to Carter Bros. Iron Works, Inc. Skateboard. 4,230,330, Cl. 280-87.04A.
Mulach, Arthur: *See*—
Calfo, Raymond M.; and Mulach, Arthur, 4,230,961, Cl. 310-68.00R.
Muldoon, James F., to Electronic Associates, Inc. Gas measurement and analysis system. 4,229,968, Cl. 73-23.100.
Muller, Hans; and Guazzone, Bruno, to Chemap AG. Method of cleaning filter elements thereof. 4,230,576, Cl. 210-797.000.
Muller, Hans K. Device for connecting an ejection pin of an injection molding tool or the like to an ejector device. 4,230,328, Cl. 279-71.000.
Muller, Hermann: *See*—
Lehmann, Wilfried; Muller, Hermann; and Baranek, Bodo, 4,230,438, Cl. 415-122.00R.
Muller, Karl: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,230,907, Cl. 179-1.00E.
Muller, Rolf, to Papst Motoren KG. Brushless, permanent magnet d-c motor with improved commutation control. 4,230,976, Cl. 318-138.000.
Mumford, George V., to Owens-Illinois, Inc. Plastic overcap for bottle package. 4,230,230, Cl. 215-321.000.
Munchinger, Bernd; and Brehm, Robert. Method of and an apparatus for packaging consumer goods. 4,229,928, Cl. 53-452.000.
Munetsugu, Eiichi, to Tokyo Shibaura Electric Co., Ltd. Device for a digital arithmetic processing apparatus. 4,231,024, Cl. 340-365.00S.
Munkoerg, John A., to Minnesota Mining and Manufacturing Company. Remote control system for traffic signal control system. 4,230,992, Cl. 328-140.000.
Mura, Lawrence A., to Nalco Chemical Company. Stable water-in-oil emulsions of cationically modified quaternized polyacrylamide and their method of preparation. 4,230,608, Cl. 260-29.4UA.
Murakami, Kunio: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, 4,230,658, Cl. 264-235.800.
Murakami, Kyoji: *See*—
Fujiyoshi, Kazuyoshi; and Murakami, Kyoji, 4,230,904, Cl. 179-1.0HF.
Muraoka, Kyouzi: *See*—
Iwasaki, Hajime; Mizuta, Kuninori; Kobayashi, Yoshinori; Yoshikawa, Tadayoshi; and Muraoka, Kyouzi, 4,230,762, Cl. 428-234.000.
Murasaki, Hiroshi; Ogawa, Masaya; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Device for automatically replenishing toner to dry-type developing apparatus for electrophotography. 4,230,070, Cl. 118-658.000.
Murata Manufacturing Co., Ltd.: *See*—
Ogawa, Toshio, 4,230,589, Cl. 252-62.900.
Murch, Robert M.; Meyer, Phyllis I.; and Eagan, John J., to W. R. Grace & Co. Flame-retardant polyurethane foams. 4,230,822, Cl. 521-106.000.
Murtha, Timothy P., to Phillips Petroleum Company. Separation of cyclohexylbenzene from a cyclohexylbenzene-cyclohexanone-phenol admixture. 4,230,638, Cl. 568-366.000.
Muse, Wyndell G.: *See*—
Comer, O. Lawrence; Muse, Wyndell G.; and Clure, Tommy, 4,230,297, Cl. 248-317.000.
Muto, Nobuyoshi: *See*—
Matsuda, Yasuo; Honda, Kazuo; and Muto, Nobuyoshi, 4,231,083, Cl. 363-135.000.
Myers, Robert M., to Rohm and Haas Company. Ethylene oxide polymers as impact modifiers for PVC. 4,230,827, Cl. 525-121.000.
Myojo Foods Company, Limited: *See*—
Yoshida, Kiyotaka; Hatanaka, Yoshio; Kudo, Kesayoshi; and Aoki, Takao, 4,230,735, Cl. 426-557.000.
Naarden International, N.V.: *See*—
Kleipool, Reinerus J. C., 4,230,734, Cl. 426-535.000.
Nachbur, Roland; and Faisst, Dieter, to Swiss Aluminium Ltd. Vehicle body construction. 4,230,361, Cl. 296-193.000.
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, to Schering Corporation. Aminoglycoside antibiotic compounds. 4,230,847, Cl. 536-10.000.
Nagai, Shuzo; Watabe, Seiji; Ogino, Takao; and Okita, Koichi, to Sumitomo Electric Industries, Ltd. Fluorine resin coated structure of aluminum or aluminum alloy. 4,230,758, Cl. 428-141.000.
Nagamachi, Tomoaki: *See*—
Yoneda, Koji; Ohashi, Takehisa; Nagamachi, Tomoaki; Fukumitsu, Hirotaka; and Takahashi, Satomi, 4,230,869, Cl. 548-314.000.
Nagasawa, Tsugio: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, 4,230,658, Cl. 264-235.800.
Nagel, John A.: *See*—
Deaver, Richard A.; Eifort, Ralph C.; and Nagel, John A., 4,230,986, Cl. 324-158.00F.
Nahabedian, Charles E.: *See*—
Hunsberger, Dennis J.; Nahabedian, Charles E.; Quinn, Thomas M.; and VanOrnum, James H., 4,231,087, Cl. 364-200.000.
Nahta, Roop C., to GAF Corporation. Foaming composition for textile finishing and coatings. 4,230,746, Cl. 427-373.000.
Nakabayashi, Masao: *See*—
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.
Nakagawa, Koji; and Watanabe, Yoshiharu, to Denki Kagaku Kogyo Kabushiki Kaisha. Concrete composition for making concrete moldings and method for making such concrete moldings. 4,230,499, Cl. 106-90.000.
Nakajima, Takato, to Kanetsu Kogyo Kabushiki Kaisha. Nonmagnetic conductive material separating apparatus. 4,230,560, Cl. 209-212.000.
Nakamura, Akira: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.
Nakamura, Hiroaki; Kaneko, Shiro; and Watanabe, Takeshi, to Fuji Photo Film Co., Ltd. Process for producing pressure-sensitive copying paper. 4,230,743, Cl. 427-146.000.
Nakamura, Kazuo: *See*—
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, 4,230,401, Cl. 354-25.000.
Nakamura, Kiyoshi; Komatsu, Michiyasu; and Nakanishi, Masae, to Tokyo Shibaura Denki Kabushiki Kaisha. Article highly resistant to corrosion by gallium phosphide and gallium arsenide. 4,230,494, Cl. 106-14.050.
Nakamura, Yakuharu: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.
Nakamura, Zenzo: *See*—
Uchiyama, Takashi; Nakamura, Zenzo; and Ohtaki, Shohei, 4,230,402, Cl. 354-33.000.
Nakanishi, Masae: *See*—
Nakamura, Kiyoshi; Komatsu, Michiyasu; and Nakanishi, Masae, 4,230,494, Cl. 106-14.050.
Nakatsubo, Toshio: *See*—
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.
Nalco Chemical Company: *See*—
Mura, Lawrence A., 4,230,608, Cl. 260-29.4UA.
Napoli, Joseph L., Jr.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,230,627, Cl. 260-397.200.
Narendra, Patrenahalli M.: *See*—
Fitch, Robert C.; and Narendra, Patrenahalli M., 4,231,065, Cl. 358-166.000.
Nartron Corporation: *See*—
Bull, David W., 4,231,082, Cl. 362-368.000.
Narwid, Thomas A.: *See*—
Despreaux, Carl; Narwid, Thomas A.; Palleroni, Norberto J.; and Uskokovic, Milan R., 4,230,625, Cl. 260-397.100.
Nasiatka, John R.; Austin, Ronald; and Schaudek, Ernest F., to Duo-Fast Corporation. Hand-held fastener driving tool. 4,230,249, Cl. 227-123.000.
National Distillers and Chemical Corporation: *See*—
Hardy, Michael F.; and Tgavalekos, Terry, 4,230,825, Cl. 525-62.000.
National Instrument Company, Inc.: *See*—
Buckley, Lawrence W., 4,230,160, Cl. 141-116.000.
National Research Development Corporation: *See*—
Irving, Stephen J., 4,230,570, Cl. 210-758.000.

National Semiconductor Corporation: *See*—
Wilcox, Milton E., 4,230,953, Cl. 307-230.000.
National Starch and Chemical Corporation: *See*—
Sirota, Julius, 4,230,834, Cl. 525-308.000.
National Steel Corporation: *See*—
Hartman, George J.; and Ewing, Vernon R., 4,230,678, Cl. 423-112.000.
NCR Corporation: *See*—
Deaver, Richard A.; Eifort, Ralph C.; and Nagel, John A., 4,230,986, Cl. 324-158.00F.
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzcek Ten Behoeve Van Nijverheid, Handel en Verkeer (Nijverheidsorganisatie T.N.O.): *See*—
Leeuwrik, Frederik H., 4,230,648, Cl. 261-87.000.
Neeley, Walter P., to Mobil Oil Corporation. Marine cable location system. 4,231,111, Cl. 367-19.000.
Neely, John A.: *See*—
Brothers, Gene A.; Neely, John A.; and Kieffe, Patrick W., 4,230,913, Cl. 179-18.0FC.
Nelson Company, The: *See*—
Mays, Gerald F., 4,230,050, Cl. 108-51.100.
Mays, Gerald F., 4,230,051, Cl. 108-55.100.
Nelson, David A. Speed control for electric motor. 4,230,977, Cl. 318-305.000.
Nestor, Charles R.: *See*—
Leonard, Robert D., Jr.; and Nestor, Charles R., 4,230,392, Cl. 339-117.00R.
Neuber, Siegfried: *See*—
Bazlen, Dieter; Berger, Rolf; Blum, Arnold; Bock, Dietrich W.; Chilinski, Herbert; Geng, Hellmuth R.; Hajdu, Johann; Irro, Fritz; and Neuber, Siegfried, 4,231,085, Cl. 364-200.000.
Neustadt, Bernard R., to Schering Corporation. Substituted 4'-polyhaloisopropylsulfonanilides. 4,230,635, Cl. 260-556.00A.
New, Maria I.: *See*—
Pang, Songja; and New, Maria I., 4,230,684, Cl. 424-1.000.
Newton, Robert P., to Autodynamics, Inc. Tire balancing machine system. 4,229,977, Cl. 73-487.000.
Ng, Wing P.: *See*—
Martin, John E.; and Ng, Wing P., 4,230,522, Cl. 156-638.000.
Nichol, Gloria C.: *See*—
Brooks, Henry W.; and Nichol, Gloria C., 4,229,880, Cl. 30-142.000.
Niedermeyer, Karl O. Through flow sump pump. 4,230,440, Cl. 417-424.000.
Nielsen, Willard J.: *See*—
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.
Nieuwenhuis, Mogens D.; and Van Bracht, Raymond, to Aquapro A.G. Ignition timing testing device. 4,230,969, Cl. 315-241.00S.
Nifco, Inc.: *See*—
Hara, Kunio, 4,229,973, Cl. 73-317.000.
Nigg, Jurg. System for overall color correction of color picture information contained in a projecting multi-color light beam. 4,230,408, Cl. 355-35.000.
Nihon Sekiyu Hanbai Kabushiki Kaisha: *See*—
Tanaka, Hiroshige, 4,230,138, Cl. 137-13.000.
Nihon, Tenganyaku Kenkyusho K.K.: *See*—
Yamauchi, Aizo; Matsuzawa, Yasuo; Kamiya, Sadayoshi; Nishioka, Keisuke; Hara, Yoshiaki; and Matsushima, Shogo, 4,230,690, Cl. 424-78.000.
Nilsson, Sven R., to Lindova Aktiebolag. Tool for installing so-called press nuts. 4,229,960, Cl. 72-114.000.
Nippon Electric Co., Ltd.: *See*—
Imigawa, Masayuki; and Mori, Toshihiro, 4,231,018, Cl. 340-171.00R.
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.
Morimoto, Koichi; and Tokumaru, Tatsuo, 4,231,075, Cl. 361-433.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; and Yamaguchi, Hiroaki, 4,230,078, Cl. 123-416.000.
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, 4,230,079, Cl. 23-568.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,230,072, Cl. 123-1.00A.
Nippon Telegraph and Telephone Public Corporation: *See*—
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.
Nishida, Masayuki; Funakoshi, Satoshi; Ogasa, Katsuhiro; Kuboyama, Morio; Yanai, Nobuya; and Yamada, Muneo, to Morinaga Milk Industry Co. Ltd.; and Green Cross Corporation, The. Virus-inactivated HGI-glycoprotein capable of stimulating proliferation and differentiation of human granulocyte, process for preparing same and leukopenia curative containing same. 4,230,697, Cl. 424-177.000.
Nishiguchi, Hisanori; Ishida, Eisuke; and Takashima, Yuji, to Matsushita Electric Industrial Co., Ltd. Electrostatic image forming process and particles comprising reactive sublimable dye, subliming developer and conductive substance. 4,230,784, Cl. 430-42.000.
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, to Olympus Optical Company Limited. Electrographic process of imaging by modulation of ions. 4,230,786, Cl. 430-53.000.
Nishikawa, Tetsuji: *See*—
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, 4,230,481, Cl. 71-92.000.
Nishimoto, Takeo: *See*—
Asari, Akira; Ueda, Masakazu; and Nishimoto, Takeo, 4,230,661, Cl. 264-323.000.
Nishioka, Keisuke: *See*—
Yamauchi, Aizo; Matsuzawa, Yasuo; Kamiya, Sadayoshi; Nishioka, Keisuke; Hara, Yoshiaki; and Matsushima, Shogo, 4,230,690, Cl. 424-78.000.
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, to Ishihara Sangyo Kaisha Limited. Pyrazole derivatives useful as a herbicidal component. 4,230,481, Cl. 71-92.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Tsujii, Yasuhiro; and Shigehara, Itaru, to Ishihara Sangyo Kaisha Limited. Process for producing 3,5-dichloro-α-methylstyrene. 4,230,642, Cl. 570-193.000.
Nishiyama, Yutaka: *See*—
Mizutani, Nagao; Kurihara, Toshio; Nishiyama, Yutaka; Kunita, Masao; Kinoshita, Teruo; and Yasunaga, Makoto, 4,230,039, Cl. 101-93.170.
Nissan Motor Company, Limited: *See*—
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,230,087, Cl. 123-193.0CH.
Nodelman, Neil H., to Mobay Chemical Corporation. Sucrose based polyether polyols. 4,230,824, Cl. 521-167.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine with a methanol reforming system. 4,230,072, Cl. 123-1.00A.
Nohira, Hidetaka; Ito, Sumio; Oki, Hisashi; and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,230,073, Cl. 123-308.000.
Nohira, Hidetaka: *See*—
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, 4,230,079, Cl. 23-568.000.
Nojiri, Michihiko; Kakutani, Kazuo; Uedono, Shigezo; Uenakai, Kazuo; and Matsumoto, Masafumi, to Mitsui Engineering & Shipbuilding Co., Ltd. Process for the production of microbial protein and lipid from vegetable carbohydrates by culture of microbes. 4,230,806, Cl. 435-255.000.
Noll, Erwin; and Knoerr, Karlheinz. Tatooing pincers for marking ears of animals. 4,230,001, Cl. 81-9.220.
Nordish Fjerfabrik Aktieselskab: *See*—
Hansen, Sigurd S., 4,230,756, Cl. 428-101.000.
Normark, Olov M. Joint. 4,230,349, Cl. 285-342.000.
Northern Engineering & Plastics Corporation: *See*—
Crisci, Harry, 4,230,229, Cl. 215-253.000.
Northwestern University: *See*—
Senyei, Andrew E.; and Widder, Kenneth J., 4,230,685, Cl. 424-12.000.
Nourry, Daniel: *See*—
Thierry, Jean-Pierre; Debionne, Alain; and Nourry, Daniel, 4,230,388, Cl. 339-74.00R.
Nowacki, Christopher A.: *See*—
Walz, Arthur J., Jr.; and Nowacki, Christopher A., 4,230,115, Cl. 128-295.000.
Nozawa, Tsuneo: *See*—
Takayama, Toshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,230,800, Cl. 435-101.000.
NRM Corporation: *See*—
Enders, George E., 4,230,517, Cl. 156-396.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Compositions and method of treatment. 4,230,727, Cl. 424-330.000.
Oakwood Manufacturing, Inc.: *See*—
Hughes, Robert S., 4,229,919, Cl. 52-263.000.
Obayashi, Hideki: *See*—
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, 4,230,079, Cl. 23-568.000.
Obayashi, Mikio; and Watanabe, Naoyoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for sulfurizing cast iron. 4,230,507, Cl. 148-6.110.
O'Connor, John D. Tile-grout applicator. 4,230,356, Cl. 294-19.00R.
Oeckl, Siegfried; Scheinpflug, Hans; and Kraus, Peter, to Bayer Aktiengesellschaft. Combating plant bacteria with acylhalogenomethyl thiocyanates. 4,230,723, Cl. 424-302.000.
Oeming, Joseph A. Feed apparatus for a lathe. 4,230,003, Cl. 82-2.700.
Oerth, Daniel P. Biorhythmic slide rule. 4,230,936, Cl. 235-70.00A.
Ogasa, Katsuhiro: *See*—
Nishida, Masayuki; Funakoshi, Satoshi; Ogasa, Katsuhiro; Kuboyama, Morio; Yanai, Nobuya; and Yamada, Muneo, 4,230,697, Cl. 424-177.000.
Ogawa, Masaya: *See*—
Murasaki, Hiroshi; Ogawa, Masaya; and Kawabata, Hidetoshi, 4,230,070, Cl. 118-658.000.
Ogawa, Toshio, to Murata Manufacturing Co., Ltd. Method for producing piezoelectric ceramics. 4,230,589, Cl. 252-62.900.
Ogino, Shigeo: *See*—
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,230,725, Cl. 424-325.000.
Ogino, Takao: *See*—
Nagai, Shuzo; Watabe, Seiji; Ogino, Takao; and Okita, Koichi, 4,230,758, Cl. 428-141.000.

Ogle, Francis H., Jr., to De Laval Turbine Inc. Check-valve construction. 4,230,148, Cl. 137-512.100.

Ogle, James A.: *See*—
Holz, George E.; Ogle, James A.; and Przybylek, George J., 4,230,967, Cl. 315-3.000.

Oguro, Tomokatsu, to Hitachi, Ltd. Cathode structure for magnetrons. 4,230,968, Cl. 315-39.510.

Ohashi, Takehisa: *See*—
Yoneda, Koji; Ohashi, Takehisa; Nagamachi, Tomoaki; Fukumitsu, Hirotaka; and Takahashi, Satomi, 4,230,869, Cl. 548-314.000.

Ohlrogge, Alvin J., to Purdue Research Foundation. Method of increasing grain yield in field corn by application of triacontanol. 4,230,485, Cl. 71-122.000.

Ohtaki, Shohei: *See*—
Uchiyama, Takashi; Nakamura, Zenzo; and Ohtaki, Shohei, 4,230,402, Cl. 354-33.000.

Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, to Japanese National Railways; Sumitomo Electric Industries, Ltd.; and Hitachi Cable Ltd. Means of stringing trolley wires. 4,230,209, Cl. 191-40.000.

Ohwada, Susumu: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.

Okada, Shuhei; Uozumi, Masana; Matsuura, Masanori; and Sadaike, Masazumi, to Hitachi Maxell, Ltd. Storage container for recording tape cartridge. 4,230,225, Cl. 206-387.000.

Okagami, Akio: *See*—
Tsuchiya, Fujio; Yamamoto, Kenzo; Yamaguchi, Katsunobu; and Okagami, Akio, 4,230,886, Cl. 562-486.000.

Okamoto, Yoshinori: *See*—
Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, 4,230,084, Cl. 123-179.00S.

Oki, Hisashi: *See*—
Nohira, Hidetaka; Ito, Sumio; Oki, Hisashi; and Kumai, Teruo, 4,230,073, Cl. 123-308.000.

Okita, Koichi: *See*—
Nagai, Shuzo; Watabe, Seiji; Ogino, Takao; and Okita, Koichi, 4,230,758, Cl. 428-141.000.

Okitsu, Hiroyuki: *See*—
Yamaji, Teizo; and Okitsu, Hiroyuki, 4,230,595, Cl. 252-188.000.

Okuda, Nobuo: *See*—
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,231,097, Cl. 364-577.000.

Okumura, Akira: *See*—
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Olginsky, Felix Y.: *See*—
Sharonov, Mikhail A.; Zainullin, Lik A.; Olginsky, Felix Y.; Scherbakov, Ivan I.; Kolpakov, Serafim V.; and Teder, Leonid I., 4,230,477, Cl. 65-141.000.

Olin Corporation: *See*—
Capuano, Italo A.; and Turley, Patricia A., 4,230,486, Cl. 75-81.000.

Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, to Snamprogetti S.p.A. Method for depolluting fresh water and salt water bodies from crude oil, petroleum products and their derivatives. 4,230,562, Cl. 210-610.000.

Olsen, Richard J., to Goodyear Tire & Rubber Company, The. Curing a replaceable tread for a big tire. 4,230,511, Cl. 156-123.00R.

Olshansky, Robert; and Sarkar, Arnab, to Corning Glass Works. High bandwidth optical waveguides and method of fabrication. 4,230,396, Cl. 350-96.310.

Olson, Richard C. Phonograph record holder. 4,230,380, Cl. 312-9.000.

Olsson, Jan T.: *See*—
Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., 4,230,040, Cl. 102-13.000.

Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Desulfurizing pellet of manganese oxide and aluminum oxide and process for producing said pellet. 4,230,603, Cl. 252-463.000.

Olympus Optical Company Limited: *See*—
Nishikawa, Masaji; Nakatsubo, Toshio; Tauda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.

Onisko, Bruce L.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,230,627, Cl. 260-397.200.

Ono, Chikai; and Toyoda, Kazuhiro, to Fujitsu Limited. Semiconductor integrated circuit device. 4,231,109, Cl. 365-174.000.

Ono, Chikai: *See*—
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.

Onoda Cement Company, Ltd.: *See*—
Itoh, Tsutomu; Ouchi, Kenji; Furuya, Nobuo; and Shimizu, Takeo, 4,230,068, Cl. 118-634.000.

O'Okiep Copper Company Limited: *See*—
Philip, Thomas P., 4,230,307, Cl. 266-46.000.

Oprisko, Jury I.: *See*—
Gusev, Vladimir A.; Oprisko, Jury I.; and Sorochinsky, Alexandr P., 4,230,425, Cl. 405-239.000.

Optic Ads (Pty.) Limited: *See*—
Uys Naude, Thomas F., 4,229,893, Cl. 40-332.000.

Orain, Michel A., to Glaenzer Spicer. Method for prestressing an axially retained homokinetic joint. 4,229,871, Cl. 29-407.000.

Orban, Jozsef: *See*—
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Orban, Jozsef, 4,230,020, Cl. 91-422.000.

Oricchio, F. Frederick: *See*—
Sheely, Harold R.; Oricchio, F. Frederick; and Ferrari, Domenic C., 4,230,668, Cl. 422-140.000.

Orient Kagaku Kogyo K.K.: *See*—
Tsuchiya, Fujio; Yamamoto, Kenzo; Yamaguchi, Katsunobu; and Okagami, Akio, 4,230,886, Cl. 562-486.000.

Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Traini, Carlo; Bianchi, Giuseppe; and Pellegri, Alberto, 4,230,542, Cl. 204-93.000.

Orr, Robert P., to Bendix Forest Products Corporation. End panel for carton. 4,230,233, Cl. 217-36.000.

Osborn, Robert A.: *See*—
Bullard, Herbert L.; and Osborn, Robert A., 4,230,842, Cl. 526-185.000.

Oshima, Masanao; Komoto, Mikihisa; Yabuki, Shoichi; and Inokawa, Tsuneo, to Mitsui Engineering & Shipbuilding Co., Ltd. Ice-breaking apparatus for structure for use in icy waters. 4,230,423, Cl. 405-211.000.

Osika, Thomas F., to McGill Manufacturing Company, Inc. Removable-key rocker type switch for two circuits. 4,230,917, Cl. 200-42.00T.

Osipow, Lloyd I.: *See*—
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,230,243, Cl. 222-402.180.

Ostermaier, Albert E. Flexible link fastener. 4,229,930, Cl. 54-79.000.

Otis Elevator Company: *See*—
Brooks, Kenneth R., 4,230,206, Cl. 187-29.00R.

Otis Engineering Corporation: *See*—
Fredd, John V., 4,230,185, Cl. 166-332.000.

Otsuka Chemical Co., Ltd.: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,230,525, Cl. 162-164.00R.

Ouchi, Kenji: *See*—
Itoh, Tsutomu; Ouchi, Kenji; Furuya, Nobuo; and Shimizu, Takeo, 4,230,068, Cl. 118-634.000.

Outboard Marine Corporation: *See*—
Baltz, Gene F., 4,230,085, Cl. 123-185.00A.

Overby, Lacy R.: *See*—
Decker, Richard H.; Ling, Chung-Mei; and Overby, Lacy R., 4,230,683, Cl. 424-1.000.

Owens-Corning Fiberglas Corporation: *See*—
Cunningham, Cecil R.; Fulmer, Ray M.; and Cherry, Gordon E., 4,230,284, Cl. 242-18.00G.

Owens-Illinois, Inc.: *See*—
Juvinall, John W., 4,230,266, Cl. 235-490.000.
Mumford, George V., 4,230,230, Cl. 215-321.000.
Pezzin, John J.; and Riggs, Darius O., 4,230,219, Cl. 198-481.000.

Ozaki, Tadashi: *See*—
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, 4,230,079, Cl. 23-568.000.

P.I.V. Antrieb Reimers Kommanditgesellschaft: *See*—
Rattunde, Manfred, 4,229,988, Cl. 474-28.000.

P.S.I. Fluid Power Ltd.: *See*—
Berryman, John E.; and Metzner, John W., 4,230,165, Cl. 144-209.00R.

Paar, Adalbert: *See*—
Burger, Alfred; and Paar, Adalbert, 4,229,958, Cl. 70-366.000.

Pacesetter Systems, Inc.: *See*—
Mann, Brian M.; and Beane, Russell R., 4,231,027, Cl. 340-636.000.

Packard Instrument Company, Inc.: *See*—
Kaartinen, Niilo H., 4,230,671, Cl. 422-159.000.

Page, Derrick J.: *See*—
Hower, Philip L.; and Page, Derrick J., 4,231,059, Cl. 357-68.000.

Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. α-Alkyl-α-hydroxybenzyl-substituted 1-sulfonylbenzimidazoles. 4,230,868, Cl. 548-306.000.

Palleroni, Norberto J.: *See*—
Despreaux, Carl; Narwid, Thomas A.; Palleroni, Norberto J.; and Uskokovic, Milan R., 4,230,625, Cl. 260-397.100.

Pallos, Ferenc M.; and Gaughan, Edmund J., to Stauffer Chemical Company. N-(Benzenesulfonyl) carbamates-herbicidal antidotes. 4,230,874, Cl. 560-12.000.

Palomo Coll, Antonio L.; and Diago Meseguer, Jose, to Antibioticos, S.A. Process for the activation of carboxylic acids. 4,230,849, Cl. 544-28.000.

Pang, Songja; and New, Maria I., to Cornell Research Foundation, Inc. Method for determining steroids in human body liquids. 4,230,684, Cl. 424-1.000.

Panzeri, Cesare, to Breda Termomeccanica S.p.A. Apparatus for automatic joint machining in heavily thick cylinders. 4,229,908, Cl. 51-103.00R.

Paper Converting Machine Company: *See*—
Charles, Richard J., 4,230,286, Cl. 242-68.600.
Wiens, Klaus, 4,230,216, Cl. 198-347.000.

Paphitis, Alexandre. Digital frequency process and method using frequency shifting techniques, especially for low frequency measurements. 4,230,991, Cl. 328-140.000.

Paphitis, Alexandre. Logic level shifters and their application in luminous display circuits. 4,231,033, Cl. 340-762.000.

Papst Motoren KG: *See*—
Muller, Rolf, 4,230,976, Cl. 318-138.000.

Paradise, William L., Jr.; and Byars, Mark L., to Airco, Inc. Methods of chilling poultry. 4,230,732, Cl. 426-393.000.

Pariza, George R.: *See*—
Burnstein, Philip J.; Pariza, George R.; and Siegel, Stephen L., 4,230,383, Cl. 339-17.00R.

Parker, Charles F. Multipurpose chair. 4,230,364, Cl. 297-468.000.

Parrini, Gianfranco: *See*—
Chiolle, Antonio; Gianotti, Giuseppe; and Parrini, Gianfranco, 4,230,583, Cl. 210-490.000.

Parry, Keith P.: *See*—
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., 4,230,484, Cl. 71-111.000.

Parsons, David: *See*—
Higgerson, Raymond; and Parsons, David, 4,229,940, Cl. 60-562.000.

Parsons, Philip E.: *See*—
Saarem, Myrl J.; and Parsons, Philip E., 4,230,142, Cl. 137-202.000.

Paspek, Stephen C.; and Every, William A., to Standard Oil Company (Ohio). Process for purification of acrylic acid by fractional crystallization. 4,230,888, Cl. 562-600.000.

Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,230,721, Cl. 424-285.000.

Pastukhov, Valery V.: *See*—
Vydrin, Vladimir N.; Pastukhov, Valery V.; Barkov, Leonid A.; and Sysoev, Vladimir S., 4,229,961, Cl. 72-235.000.

Patel, Mahesh G.: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,230,799, Cl. 435-76.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,230,747, Cl. 427-423.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,230,748, Cl. 427-423.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,230,749, Cl. 427-423.000.

Patel, Vishnu A.: *See*—
Eagle, Raymond S.; and Patel, Vishnu A., 4,230,669, Cl. 422-148.000.

Patton, Franklin D.; and McFarlane, James D., to Westbay Instruments Ltd. Isolating packer units in geological and geophysical measuring casings. 4,230,180, Cl. 166-185.000.

Paulk, John R., to Paulk Manufacturing Co., Inc. Peanut digger-shaker-inverter. 4,230,188, Cl. 171-101.000.

Paulk Manufacturing Co., Inc.: *See*—
Paulk, John R., 4,230,188, Cl. 171-101.000.

Paulson, Jerome I.: *See*—
Avery, Hugh E., Jr.; and Paulson, Jerome I., 4,230,426, Cl. 406-191.000.

Pawson, Beverly A.: *See*—
Klaus, Michael J.; and Pawson, Beverly A., 4,230,872, Cl. 549-62.000.

Peabody, Roger H., to United States of America, Navy. Blip scan analyzer. 4,231,036, Cl. 343-5.0EM.

Pearsall, Thomas, to Thomson-CSF. Heterojunction photodiode of the avalanche type. 4,231,049, Cl. 357-13.000.

Pedroso, Raul I.; and Auer, Robert E., to Coulter Electronics, Inc. Biohazard containment apparatus and method. 4,230,031, Cl. 98-115.0LH.

Peeples, Denny L., to General Motors Corporation. Hydraulic booster with accumulator control. 4,230,018, Cl. 91-6.000.

Pegourie, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche-Anvar. Step by step motor and/or brake device. 4,229,984, Cl. 74-125.500.

Pellegri, Alberto: *See*—
Traini, Carlo; Bianchi, Giuseppe; and Pellegri, Alberto, 4,230,542, Cl. 204-93.000.

Pelletier, Martin P.: *See*—
Moreau, Jean R.; Pelletier, Martin P.; and Tremblay, Gerard B., 4,230,459, Cl. 44-10.00B.

Pengilly, Brian W.: *See*—
Broughton, Roy M., Jr.; Callander, Douglas D.; Pengilly, Brian W.; Schirmer, Joseph P.; and Winters, Terence E., 4,230,818, Cl. 528-272.000.

Pennington, Donald A.: *See*—
Arnold, Charles R.; and Pennington, Donald A., 4,230,614, Cl. 260-33.6PQ.

Pennington, James R. In situ method of processing bituminous coal. 4,230,181, Cl. 166-259.000.

Peresada, Vitaly P.: *See*—
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; and Peresada, Vitaly P., 4,230,856, Cl. 544-349.000.

Perez, Edwin C. Instrument for use in hair cutting. 4,230,134, Cl. 132-45.00R.

Perkins, Patrick: *See*—
Vollhardt, Kurt P. C.; and Perkins, Patrick, 4,230,633, Cl. 260-449.60M.

Pernigotti, Allan: *See*—
Kilty, Michael; and Pernigotti, Allan, 4,230,573, Cl. 210-767.000.

Perryman, Albert A. Spray booth with ventilation. 4,230,032, Cl. 98-115.0SB.

Persoons, Gustaaf M.; and Wijts, Corneel C., to FMC Corporation. Harvesters. 4,229,932, Cl. 56-13.500.

Persyn, Roland. Tow stabilizer. 4,230,333, Cl. 280-406.00A.

Peterson, Larry W., to Shell Oil Company. Herbicide antidotes. 4,230,482, Cl. 71-93.000.

Peterson, Richard F.: *See*—
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.

Peth, Dennis K.: *See*—
Haack, William M.; and Peth, Dennis K., 4,230,657, Cl. 264-234.000.

Petroleum Designers, Inc.: *See*—
Pierce, Elwood K., Jr., 4,230,299, Cl. 251-14.000.

Petrolite Corporation: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,230,839, Cl. 526-75.000.

Petroski, Alex: *See*—
Taylor, Lauren P.; and Petroski, Alex, 4,230,676, Cl. 422-62.000.

Petrosky, Charles. Pressurized porous material cushion shoe base. 4,229,889, Cl. 36-28.000.

Petrozorbent Corporation: *See*—
Faudree, Thomas L., III, 4,230,566, Cl. 210-693.000.

Petrunich, Raymond W. Trappers tool and method of use. 4,230,355, Cl. 294-15.000.

Pezzin, John J.; and Riggs, Darius O., to Owens-Illinois, Inc. Cavity identification handling system. 4,230,219, Cl. 198-481.000.

Pfannkuche, Fritz T. Core sampling apparatus and method. 4,230,192, Cl. 175-59.000.

Pfizer Inc.: *See*—
Andrews, Glenn C., 4,230,880, Cl. 560-174.000.
Cross, Peter E.; and Dickinson, Roger P., 4,230,714, Cl. 424-263.000.
Gristina, Anthony G., 4,229,840, Cl. 3-1.910.

Pfleiderer, Hans-Joerg: *See*—
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,231,002, Cl. 333-165.000.

Pfoertner, Karlheinz: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.

Pfohl, Rainer: *See*—
Lohrberg, Karl; Pfohl, Rainer; Schubert, Jurgen; and Gritschke, Martin, 4,230,569, Cl. 210-754.000.

Philip, Thomas P., to O'Okiep Copper Company Limited. Cooling apparatus for copper converter opening. 4,230,307, Cl. 266-46.000.

Phillips, D. Colin: *See*—
Smith, James D. B.; Phillips, D. Colin; and Grossett, Kenneth W., 4,229,974, Cl. 73-339.00R.

Phillips, Dougald S. M.; and Phillips, Peter A. J., to AHI Operations Limited. Methods of and/or means for indicating the levels of liquids. 4,229,972, Cl. 73-304.00R.

Phillips, Evan M. Pulsator valves. 4,230,141, Cl. 137-103.000.

Phillips, Peter A. J.: *See*—
Phillips, Dougald S. M.; and Phillips, Peter A. J., 4,229,972, Cl. 73-304.00R.

Phillips Petroleum Company: *See*—
Bellinger, Robert M.; and Clayton, Hadwen A., 4,230,437, Cl. 415-1.000.
Blore, James H., 4,229,954, Cl. 66-196.000.
Bonazza, Benedict R.; and Schiff, Sidney, 4,230,588, Cl. 252-51.50A.
Chapman, Charles C.; and Van Pool, Joe, 4,230,666, Cl. 422-106.000.
Forseth, Glenn J., 4,230,670, Cl. 422-151.000.
Giroux, Victor A., 4,230,533, Cl. 203-1.000.
Murtha, Timothy P., 4,230,638, Cl. 568-366.000.
Richardson, Robert C., 4,230,479, Cl. 71-30.000.
Ririe, Otis E., Jr., 4,229,971, Cl. 73-61.00R.
Stewart, William S., 4,230,534, Cl. 203-1.000.
Wu, Yulin, 4,230,885, Cl. 562-481.000.

Phillips, Roy L. Adjustable egg carrier system. 4,230,071, Cl. 119-21.000.

Phillips, Steven J.: *See*—
Zeff, Robert H.; and Phillips, Steven J., 4,230,096, Cl. 128-1.00R.

Phillips, Thomas R., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral laminates with tetraethyleneglycol di-n-heptanoate plasticizer. 4,230,771, Cl. 428-437.000.

Piasecinski, Joseph J.; and Doerschuk, Ernest E., III, to RCA Corporation. Method for making etch-resistant stencil with dichromate-sensitized alkali-caseinate coating. 4,230,781, Cl. 430-5.000.

Piazza, Joan A.: *See*—
Piazza, Nicholas F.; and Piazza, Joan A., 4,230,111, Cl. 128-225.000.

Piazza, Nicholas F.; and Piazza, Joan A. Hygienic syringe and cleansing method. 4,230,111, Cl. 128-225.000.

Pickering, Norman C.; and Bronson, Nathaniel R., II, to High Stoy Technological Corporation. Output display for B-scan ultrasonoscope. 4,230,124, Cl. 128-660.000.

Pickles, Joseph, to Ferro Manufacturing Corporation. Window regulator. 4,229,906, Cl. 49-352.000.

Pierce, Elwood K., Jr., to Petroleum Designers, Inc. Pressure balanced gate valve having selective actuator systems. 4,230,299, Cl. 251-14.000.

Pierce, Paul, Jr.; and Beedy, Robert G., to B. H. Bunn Company. Method for improving tie material tension in package tying machines. 4,230,035, Cl. 100-2.000.

Pietersen, Anthonius H. Method for making solid materials having a flash point of less than 500° C. fire alarming, fire alarming and self extinguishing, or fire alarming, self-extinguishing and fire abating. 4,230,808, Cl. 428-307.000.

Piguet, Christian, to Centre Electronique Horloger S.A. Logic JK flip-flop structure. 4,230,957, Cl. 307-279.000.

Pines, Seemon H.: *See—*
Saperstein, David D.; and Pines, Seemon H., 4,230,883, Cl. 562-445.000.

Pistiner, Josef S., to RCA Corporation. Closed loop roll control for momentum biased satellites. 4,230,294, Cl. 244-170.000.

Pitts, Robert W., Jr., to Texaco Inc. High speed copying means and method. 4,231,070, Cl. 358-285.000.

Pittway Corporation: *See—*
Burnstein, Philip J.; Pariza, George R.; and Siegel, Stephen L., 4,230,383, Cl. 339-17.00R.

Plamper, Gunter, to MTD Products Inc. Steering wheel mounting. 4,229,994, Cl. 74-552.000.

Plantan, Ronald S., to White Motor Corporation. Brake system. 4,230,373, Cl. 303-7.000.

Plessey Canada Limited: *See—*
Davis, John Christopher H.; and Hatherill, Richard A., 4,230,908, Cl. 179-1.0CN.

Pohl, Corriene S.: *See—*
Bustard, Thomas S.; and Pohl, Corriene S., 4,230,597, Cl. 252-301.10W.

Polazzi, Joseph O.: *See—*
Kotick, Michael P.; Schut, Robert N.; Polazzi, Joseph O.; and Leland, David L., 4,230,712, Cl. 424-260.000.

Pold, Ilmar: *See—*
Pold, Juri; and Pold, Ilmar, 4,230,245, Cl. 224-39.000.

Pold, Juri; and Pold, Ilmar. Parcel carriers for motor cycles. 4,230,245, Cl. 224-39.000.

Polyair Produkt Design Gesellschaft m.b.H.: *See—*
Weigl, Erwin; and Stritzl, Karl, 4,230,338, Cl. 280-618.000.

Ponomarev, Vladimir S.: *See—*
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.00C.

Ponzio, Vittorio. Process and apparatus for automatically identifying discount coupons and the like by means of electronic comparison. 4,231,014, Cl. 340-146.30Y.

Popovitch, Dragolyoub. Point-detonating impact fuze. 4,230,042, Cl. 102-233.000.

Poret, Henri, to Regie Nationale des Usines Renault. Multinozzle block for spraying tool surfaces. 4,230,270. Cl. 239-67.000.

Porsche, Ferdinand A. Bicycle frame. 4,230,332, Cl. 280-281.00B.

Porter, John T., II, to General Atomic Company. Method for separating krypton isotopes. 4,230,547, Cl. 204-157.10R.

Porter, Raymond J., to Barlow Marine Limited. Self-tailing winch. 4,230,306, Cl. 254-371.000.

Potter, Gene B.; and Jurick, Martin H., to Lear Siegler, Inc. Method and apparatus for saving energy. 4,230,970, Cl. 315-307.000.

Powell, Lawson W.: *See—*
Savidge, Thomas A.; and Powell, Lawson W., 4,230,804, Cl. 435-180.000.

Power Conversion, Inc.: *See—*
Sullivan, James R., 4,231,026, Cl. 340-636.000.

Powerpak, Inc.: *See—*
Kowall, James L.; and Taylor, Paul M., 4,230,227, Cl. 206-600.000.

Powers, John E.: *See—*
Gomberg, Henry J.; Lewis, John G.; and Powers, John E., 4,229,942, Cl. 60-644.000.

PPG Industries, Inc.: *See—*
Dunk, Ronald G., 4,230,475, Cl. 65-118.000.
Lavanish, Jerome M., 4,230,480, Cl. 71-90.000.
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,230,552, Cl. 204-181.00C.

PQ Corporation: *See—*
Falcone, James S., Jr.; and Spencer, Robert W., 4,230,496, Cl. 106-14.210.

Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, to Akzona Incorporated. Polyether lubricants for use in the processing of plastics. 4,230,612, Cl. 260-33.20R.

Pratt & Lambert, Inc.: *See—*
Wolinski, Leon E.; and Berezuk, Peter D., 4,230,613, Cl. 156-315.000.

Prener, Jerome S.: *See—*
Cusano, Dominic A.; and Prener, Jerome S., 4,230,510, Cl. 156-67.000.

Prengaman, Raymond D.; and McDonald, Herschel B., to RSR Corporation. Process for reducing lead peroxide formation during lead electrowinning. 4,230,545, Cl. 204-114.000.

Procter & Gamble Company, The: *See—*
Francis, Marion D., 4,230,700, Cl. 424-204.000.

Proeschl, Bernard E., to Caterpillar Tractor Co. Method of making a modular truck body. 4,230,254, Cl. 228-182.000.

Promeyrat, Maurice J., to Societe Civile Promeyrat-Casteilia-Techniques Nouvelles du Moteur. Reciprocating piston. 4,230,027, Cl. 92-159.000.

Provalsky, Gennady B.: *See—*
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B., 4,229,946, Cl. 62-341.000.

Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Alcoholysis process for preparing poly-(tetramethylene ether) glycol. 4,230,892, Cl. 568-617.000.

Prudence, Robert T., to Goodyear Tire & Rubber Company, The. Process for medium vinyl polybutadiene. 4,230,841, Cl. 526-179.000.

Przybylek, George J.: *See—*
Holz, George E.; Ogle, James A.; and Przybylek, George J., 4,230,967, Cl. 315-3.000.

PTX-Pentronix, Inc.: *See—*
DeSantis, Raymond P., 4,230,653, Cl. 264-39.000.

Pullman Berry Company: *See—*
Rymarchyk, Nicholas M.; and Meinert, Leo L., 4,230,274, Cl. 239-132.300.

Pullman Incorporated: *See—*
Becker, Colman L.; and LeBlanc, Joseph R., 4,230,680, Cl. 423-360.000.
Eagle, Raymond S.; and Patel, Vishnu A., 4,230,669, Cl. 422-148.000.
Glassmeyer, John J., 4,230,335, Cl. 280-423.00A.

Purcell, Robert J.; and Sturges, James R., to Caterpillar Tractor Co. Resilient support pad for crawler type vehicles. 4,230,378, Cl. 305-22.000.

Purdue Research Foundation: *See—*
Ohlrogge, Alvin J., 4,230,485, Cl. 71-122.000.

Purdy, Kenneth R.: *See—*
Bowen, Mack D.; and Purdy, Kenneth R., 4,230,602, Cl. 252-421.000.

Purification Sciences Inc.: *See—*
Lowther, Frank E., 4,230,075, Cl. 123-68.000.

Purvis, Marshall T., to Rohm and Haas Company. Single stage continuous graft polymerization process and product. 4,230,833, Cl. 525-260.000.

Quasar Microsystems, Inc.: *See—*
Baum, Elliot I., 4,230,909, Cl. 179-6.00R.

Quinn, Thomas M.: *See—*
Hunsberger, Dennis J.; Nahabedian, Charles E.; Quinn, Thomas M.; and VanOrnum, James H., 4,231,087, Cl. 364-200.000.

Rabus, Friedrich: *See—*
Grob, Ferdinand; and Rabus, Friedrich, 4,231,092, Cl. 364-431.000.

Rader Companies, Inc.: *See—*
Smith, William C., 4,230,559, Cl. 209-139.00R.

Radu, E. John: *See—*
Springett, Charles N.; Abramovich, Dan; Uyeda, Stanley T.; and Radu, E. John, 4,230,421, Cl. 405-168.000.

Raghu, Sivaraman, to American Cyanamid Company. Processes for the separation of enantiomers by selective crystallization. 4,230,860, Cl. 546-134.000.

RAI Research Corporation: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Sentisi, Joseph C., 4,230,549, Cl. 204-159.170.

Rajpara, Jagdish: *See—*
Ehrenthal, Irving; Slapshak, Louis F.; and Rajpara, Jagdish, 4,230,802, Cl. 435-94.000.

Ralston Purina Company: *See—*
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,230,736, Cl. 426-601.000.

Rambold, Klaus, to Siemens Aktiengesellschaft. Current supply installation with voltage-controlled current supply devices connected in parallel on the output side. 4,230,981, Cl. 323-25.000.

Rankin, Georgia A. Yarn holder and dispenser for making hooked rugs. 4,229,864, Cl. 28-147.000.

Rao, Vemulapalli D. N., to Ford Motor Company. Method of fabricating a heat exchanger for Stirling engine. 4,230,651, Cl. 264-29.700.

Rattunde, Manfred, to P.I.V. Antrieb Reimers Kommanditgesellschaft. Continuously variable cone pulley belt-drive gearing. 4,229,988, Cl. 474-28.000.

Rawson, Francis F. H., to USM Corporation. Fastener suitable for attaching a heel to a shoe. 4,229,888, Cl. 36-1.000.

Rawson, James L.: *See—*
Leigh, Theodore M.; and Rawson, James L., 4,230,280, Cl. 239-677.000.

Raytheon Company: *See—*
Barr, Paul C.; and Grogansky, Herbert L., 4,231,102, Cl. 364-726.000.

RCA Corporation: *See—*
Ahmed, Adel A. A., 4,230,998, Cl. 331-111.000.
Ahmed, Adel A. A., 4,230,999, Cl. 331-115.000.
Barkow, William H., 4,231,009, Cl. 335-212.000.
McCarthy, Donald C., 4,230,794, Cl. 430-323.000.
Piascinski, Joseph J.; and Doerschuk, Ernest E., III, 4,230,781, Cl. 430-5.000.
Pistiner, Josef S., 4,230,294, Cl. 244-170.000.
Stewich, Max W., 4,231,062, Cl. 358-109.000.
Wu, Chung P.; and Rosen, Arye, 4,230,505, Cl. 148-1.500.

Rebours, Albert; and Guibet, Jean-Pierre, to Air Industrie. Dust separator with declogging device. 4,230,468, Cl. 55-294.000.

Reed, John W.: *See—*
Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., 4,231,088, Cl. 364-200.000.

Reed, Robert D., to John Zink Company. Apparatus for reducing hydrocarbon fuel requirement for Haber ammonia synthesis. 4,230,278, Cl. 239-427.500.

Rees, Herbert; and Robinson, Allan H., to Husky Injection Molding Systems Limited. Mold-clamping mechanism for injection-molding machine. 4,230,442, Cl. 425-451.200.

Regie Nationale des Usines Renault: *See—*
Poret, Henri, 4,230,270, Cl. 239-67.000.

Rego Company: *See—*
Billington, Evans R.; Batka, Robert J.; and Korbilas, Christ P., 4,230,161, Cl. 141-302.000.

Reid, Margaret P.: *See—*
Mag, Theodore K.; and Reid, Margaret P., 4,230,630, Cl. 260-428.000.

Reilly Tar & Chemical Corp.: *See—*
Bailey, Thomas D., 4,230,864, Cl. 546-303.000.

Reimers, Robert, to Litton Industrial Products Inc. Light assembly for use with a dental handpiece. 4,230,453, Cl. 433-29.000.

Rembold, Heinz: *See—*
Losert, Ewald; and Rembold, Heinz, 4,230,793, Cl. 430-315.000.

Renner, Gunter; and Scheben, Quirin, to AGFA-Gevaert, A.G. Process for the production of 2-equivalent yellow couplers. 4,230,851, Cl. 544-183.000.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,230,288, Cl. 242-107.000.
Fohl, Artur, 4,230,289, Cl. 242-107.40A.

Research Corporation: *See—*
Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, 4,230,698, Cl. 424-180.000.

Research Foundation of the City University of New York: *See—*
Ronn, Avigdor M., 4,230,546, Cl. 204-157.10R.

Rhoades, John P., to Stainless Icetainer Company. Two piece cabinet cover. 4,230,381, Cl. 312-295.000.

Rhodes, Ronald J.: *See—*
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,230,553, Cl. 204-192.00E.

Rhone-Poulenc Industries: *See—*
Lizee, Dominique, 4,230,575, Cl. 210-780.000.

Rice, Patrick F.: *See—*
Barker, Robert I.; King, David P.; and Rice, Patrick F., 4,229,970, Cl. 73-56.000.

Richardson, Billy H. Device for alining the spine. 4,230,099, Cl. 128-69.000.

Richardson Company, The: *See—*
Thomas, Daniel C., 4,230,492, Cl. 430-159.000.

Richardson-Merrell Inc.: *See—*
Albrecht, William L.; and Jones, Winton D., 4,230,715, Cl. 424-269.000.

Richardson, Robert C., to Phillips Petroleum Company. Process for improving the quality of urea-ammonium nitrate solution. 4,230,479, Cl. 71-30.000.

Richdel, Inc.: *See—*
Saarem, Myrl J.; and Parsons, Philip E., 4,230,142, Cl. 137-202.000.

Richter, Alice E. Splints for treating jaw fractures. 4,230,104, Cl. 128-89.00A.

Ricoh Co., Ltd.: *See—*
Horike, Masanori; Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,231,048, Cl. 346-140.00R.
Iwasaki, Kyuhachiro; Kodama, Yutaka; Jinnai, Koichiro; and Horike, Masanori, 4,231,047, Cl. 346-75.000.

Riggs, Darius O.: *See—*
Pezzin, John J.; and Riggs, Darius O., 4,230,219, Cl. 198-481.000.

Ririe, Otis E., Jr., to Phillips Petroleum Company. Liquid sampling system. 4,229,971, Cl. 73-61.00R.

Rivetti, Franco: *See—*
Romano, Ugo; and Rivetti, Franco, 4,230,881, Cl. 560-193.000.

Rizla Limited: *See—*
Crisp, David, 4,230,132, Cl. 131-70.000.

Robbins, William E.: *See—*
Fisher, William F.; Thompson, Malcolm J.; Wright, Fred C.; and Robbins, William E., 4,230,726, Cl. 424-325.000.

Robert Bosch GmbH: *See—*
Goebels, Hermann J., 4,230,377, Cl. 303-118.000.
Grob, Ferdinand; and Rabus, Friedrich, 4,231,092, Cl. 364-431.000.
Leiber, Heinz, 4,230,375, Cl. 303-105.000.
Stumpp, Gerhard; and Banzhaf, Werner, 4,230,080, Cl. 123-568.000.
Wessel, Wolf; and Eckert, Konrad, 4,230,083, Cl. 123-450.000.

Robertiello, Andrea: *See—*
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,230,562, Cl. 210-610.000.

Roberts, Robert D.: *See—*
Matrone, John L.; and Roberts, Robert D., 4,230,985, Cl. 324-158.00F.

Roberts, William M.; and Kohn, Jean, to Baltek Corporation. Liquid cargo container. 4,230,061, Cl. 114-74.00A.

Robertshaw Controls Company: *See—*
Tyler, Hugh J., 4,230,731, Cl. 426-233.000.

Robinson, Allan H.: *See—*
Rees, Herbert; and Robinson, Allan H., 4,230,442, Cl. 425-451.200.

Robinson, Thomas S.: *See—*
Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., 4,231,088, Cl. 364-200.000.

Robles, Martin J.: *See—*
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,230,552, Cl. 204-181.00C.

Rockwell International Corporation: *See—*
Custode, Frank Z.; and Tam, Matthias L., 4,231,051, Cl. 357-23.000.
Martin, John E.; and Ng, Wing P., 4,230,522, Cl. 156-638.000.

Roennau, Raymond B.; Chung, Daniel A.; and Jasani, Shirish, to Goodyear Tire & Rubber Company, The. Metal photopolymer substrates. 4,230,770, Cl. 428-424.400.

Roesler, Frank C., deceased (by Roesler, Johanna, executrix), to Imperial Chemical Industries Limited. Treatment of biologically-degradable waste. 4,230,563, Cl. 210-629.000.

Roesler, Johanna, executrix: *See—*
Roesler, Frank C., deceased, 4,230,563, Cl. 210-629.000.

Roger, Michel: *See—*
Aurousseau, Andre; and Roger, Michel, 4,230,021, Cl. 91-461.000.

Rohm, Gunter H. Drill chuck. 4,230,327, Cl. 279-61.000.

Rohm and Haas Company: *See—*
Myers, Robert M., 4,230,827, Cl. 525-121.000.
Purvis, Marshall T., 4,230,833, Cl. 525-260.000.
Swift, Graham; Bartman, Benjamin; and Cenci, Harry J., 4,230,772, Cl. 428-442.000.
Weiler, Ernest D., 4,230,704, Cl. 424-248.510.

Rohrig, Eberhard. Aircraft pallet for over-hanging load. 4,230,044, Cl. 104-135.000.

Roman, Steven A., to Shell Oil Company. Insecticidal sulfonium salts. 4,230,863, Cl. 546-246.000.

Romano, Ugo; and Rivetti, Franco, to Snamprogetti, S.p.A. Preparing oxalic acid esters. 4,230,881, Cl. 560-193.000.

Ronn, Avigdor M., to Research Foundation of the City University of New York. Method of molecular specie alteration by nonresonant laser induced dielectric breakdown. 4,230,546, Cl. 204-157.10R.

Rosen, Arye: *See—*
Wu, Chung P.; and Rosen, Arye, 4,230,505, Cl. 148-1.500.

Rosenberg, Eugene: *See—*
Gutnick, David L.; and Rosenberg, Eugene, 4,230,801, Cl. 435-101.000.

Rosenbrook, William, Jr., to Abbott Laboratories. Process for producing 3-O-demethylfortimicins. 4,230,848, Cl. 536-17.00R.

Ross, William J.: *See—*
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,709, Cl. 424-256.000.
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,716, Cl. 424-273.00R.

Rossmann, Axel: *See—*
Betz, Wolfgang; and Rossmann, Axel, 4,230,745, Cl. 427-255.400.

Roth, Mario; Winandy, Johann; and Siemonsen, Hans-Pieter, to Saint-Gobain Industries. Apparatus and process for simultaneous thermic glass sheet hardening. 4,230,474, Cl. 65-114.000.

Rothfuss, Hermann: *See—*
Wenzlick, Erich; and Rothfuss, Hermann, 4,230,382, Cl. 312-330.00R.

Rottigni, Joseph G. Valve adjustment tool. 4,229,999, Cl. 81-3.00F.

Rovnyak, Richard M.: *See—*
Lee, David Q.; and Rovnyak, Richard M., 4,230,912, Cl. 179-16.0EA.

Rowe, Anthony P. V. Wheel units. 4,229,855, Cl. 16-29.000.

Rowe, Charles L. Throwaway plastic thermometer structure. 4,229,975, Cl. 73-371.000.

Rowe, Colin F.: *See—*
Batch, Jeremy J.; Parry, Keith P.; Rowe, Colin F.; Lawrence, David K.; and Brown, Michael J., 4,230,484, Cl. 71-111.000.

Rowling, Sidney, to Seidman, Jack, a part interest. Method of making booklet. 4,229,926, Cl. 53-429.000.

Rowsell, David G.; Spring, David J.; and Hems, Roger, to Wilkinson Sword Limited. Acyclic carboxamides having a physiological cooling effect. 4,230,688, Cl. 424-45.000.

Roz, Bernard: *See—*
Bonmati, Reynald; Roz, Bernard; and Tollet de Santerre, Henri, 4,230,464, Cl. 55-23.000.

Rozmus, Walter J., to Kelsey-Hayes Company. Method for filling and sealing a container. 4,229,872, Cl. 29-420.000.

RSR Corporation: *See—*
Prengaman, Raymond D.; and McDonald, Herschel B., 4,230,545, Cl. 204-114.000.

Rubin, Wolfgang: *See—*
Aucktor, Erich; and Rubin, Wolfgang, 4,229,952, Cl. 64-21.000.

Rucman, Rudolf, to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o. Process for the preparation of N-substituted esters of 9,10-dihydrolysergicacids. 4,230,859, Cl. 546-69.000.

Ruda, Gunter, to Audi NSU Auto Union AG. Automotive seat with built-in child restraint. 4,230,366, Cl. 297-487.000.

Rueckl, Roger L., to United States Steel Corporation. Coke oven patching and sealing material. 4,230,498, Cl. 106-58.000.

Ruetsch, Christian; and Sittig, Roland, to BBC Brown, Boveri & Company, Limited. Thyristor with starting and generating cathode base contacts for use in rectifier circuits. 4,231,054, Cl. 357-38.000.

Ruffing, James M.: *See—*
Fellinger, Frank; and Ruffing, James M., 4,230,911, Cl. 370-84.000.

Rumianca S.p.A.: *See—*
Messori, Vittorio; and Francese, Renato, 4,230,853, Cl. 544-204.000.

Rusconi, Aldo: *See—*
Capaccioni, Mario; Gentile, Laurentino; and Rusconi, Aldo, 4,230,855, Cl. 544-348.000.

Rush, Jerome B. Combined door and window frame system. 4,229,905, Cl. 49-143.000.

Rust, Ray D.: *See—*
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,230,553, Cl. 204-192.00E.

Rustioni, Massimo: *See—*
Balducci, Luigi; and Rustioni, Massimo, 4,230,500, Cl. 106-288.00B.

Rymarchyk, Nicholas M.; and Meinert, Leo L., to Pullman Berry Company. Lance for removing skulls from steelmaking vessels. 4,230,274, Cl. 239-132.300.

Ryobi, Ltd.: *See—*
Urakami, Akio, 4,229,898, Cl. 43-21.200.

S & C Electric Company: *See—*
Zulaski, John A., 4,231,028, Cl. 340-644.000.

S & F Sheet Metal and Welding Works Inc.: *See*—
Waters, Erwin, 4,229,948, Cl. 62-376.000.
Saarem, Myrl J.; and Parsons, Philip E., to Richdel, Inc. Vent/vacuum breaker float valve assembly. 4,230,142, Cl. 137-202.000.
SAB Industri AB: *See*—
Bjork, Jan; Olsson, Jan T.; Lindgren, Bo S.; Borg, Arne G.; and Andersson, Jan A. R., 4,230,040, Cl. 102-13.000.
Sacks, William: *See*—
Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,230,656, Cl. 264-171.000.
Sadaike, Masazumi: *See*—
Okada, Shuhei; Uozumi, Masana; Matsuura, Masanori; and Sadaike, Masazumi, 4,230,225, Cl. 206-387.000.
St. Clair, Richard P., to Teradyne, Inc. Generating timing signals. 4,231,104, Cl. 364-900.000.
Saint-Gobain Industries: *See*—
Levecque, Marcel; and Battigelli, Jean A., 4,230,471, Cl. 65-2.000.
Marcault, Jeannik, 4,230,271, Cl. 239-113.000.
Roth, Mario; Winandy, Johann; and Siemonsen, Hans-Pieter, 4,230,474, Cl. 65-114.000.
St. Luke's Hospital: *See*—
Hashim, George A., 4,230,596, Cl. 424-177.000.
Sair, Louis; and Sair, Ralph A., to Griffith Laboratories U.S.A., Inc. Encapsulation of active agents as microdispersions in homogeneous natural polymeric matrices. 4,230,687, Cl. 424-22.000.
Sair, Ralph A.: *See*—
Sair, Louis; and Sair, Ralph A., 4,230,687, Cl. 424-22.000.
Saito, Masao; Aoyama, Tetsuo; Horie, Shigeru; and Takada, Kazuo, to Mitsubishi Gas Chemical Company, Inc. Process for producing dimethyl formamide. 4,230,636, Cl. 260-561.00R.
Sakashita, Nobuyuki: *See*—
Nishiyama, Ryuzo; Kimura, Fumio; Haga, Takahiro; Sakashita, Nobuyuki; and Nishikawa, Tetsuji, 4,230,481, Cl. 71-92.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; Moriguchi, Kisoo; and Mizutani, Shigeru, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyethylene blend composition. 4,230,831, Cl. 525-240.000.
Salyer, Ival O.; and Usmani, Arthur M., to Monsanto Research Corporation. Electrosynthesis process for making amine/aldehyde porous structures and powders. 4,230,551, Cl. 204-181.00R.
Sanderson, Leon F.: *See*—
Schlueter, Francis E.; Copley, Russell D.; and Sanderson, Leon F., 4,229,931, Cl. 56-10.200.
Sandman, Michael A.; and Loughlin, Bernard T., to Eli Sandman Company. Abrasive wheels. 4,230,461, Cl. 51-295.000.
Sandoz Ltd.: *See*—
Drake, William O.; Hinsken, Hans; Mayerhoefer, Horst; and Mueller, Wolfgang H., 4,230,857, Cl. 544-388.000.
Sano, Seisuke; Maeda, Masato; and Iguchi, Morimichi, to Yokogawa Electric Works, Ltd.; and Mitaka Instrument Co., Ltd. Oxygen gas analyzer using a solid electrolyte. 4,230,555, Cl. 204-195.00S.
Sano, Yoshiaki; Hanazawa, Toshio; and Honda, Hideo, to Fujitsu Limited. Bias circuit. 4,230,980, Cl. 323-19.000.
Sansho Co., Ltd.: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,230,525, Cl. 162-164.00R.
Santa Fe International Corporation: *See*—
Springett, Charles N.; Abramovich, Dan; Uyeda, Stanley T.; and Radu, E. John, 4,230,421, Cl. 405-168.000.
Santek, Inc.: *See*—
Michel, Thomas J., 4,230,466, Cl. 55-147.000.
Santora, Norman J.: *See*—
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,230,727, Cl. 424-330.000.
Saotome, Kiyoshi. Process for prevention of plant infections caused by scattered spores and composition. 4,230,694, Cl. 424-172.000.
Saperstein, David D.; and Pines, Seemon H., to Merck & Co., Inc. Preparation of hydroxyphenylalanine hydrohalide salts. 4,230,883, Cl. 562-445.000.
Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin analogues. 4,230,617, Cl. 260-112.50S.
Sargent Industries, Inc.: *See*—
Smith, Fred T., 4,230,359, Cl. 296-101.000.
Sarkar, Arnab: *See*—
Olshansky, Robert; and Sarkar, Arnab, 4,230,396, Cl. 350-96.310.
Saruwatari, Kohichi; Isawa, Kazuo; Maejima, Masatsugu; and Suzuki, Takao, to Fujikura Cable Works, Ltd. Method for surface treatment of anodic oxide film. 4,230,539, Cl. 204-35.00N.
Sasaki Electric Mfg. Co. Ltd.: *See*—
Hitora, Shozo, 4,231,078, Cl. 362-35.000.
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Apparatus for electrical discharge machining of cylindrical work. 4,230,927, Cl. 219-69.00C.
Sato, Masanori: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,229,998, Cl. 74-865.000.
Sato, Yasuhisa: *See*—
Tsuji, Sadahiko; and Sato, Yasuhisa, 4,230,398, Cl. 350-184.000.
Savidge, Thomas A.; and Powell, Lawson W., to Beecham Group Limited. Water-insoluble penicillin acylase preparation. 4,230,804, Cl. 435-180.000.
Savinov, Evgeny A.; and Baranaev, Mikhail I. Machine for noncutting metal shaping. 4,229,963, Cl. 72-402.000.
Saxon Industries, Inc.: *See*—
Skolnick, Barry, 4,230,763, Cl. 428-246.000.
Scarafile, Cosimo: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Lombardi, Paolo; Scarafile, Cosimo; and Arcamone, Federico, 4,230,619, Cl. 260-239.00A.
Scaramucci, Domer. Disc valve. 4,230,139, Cl. 137-74.000.
Scaramucci, Domer. Tilting disc check valve. 4,230,150, Cl. 137-527.000.
Schantz, Spencer C.; and Kuebler, Gary R. Snap acting switch. 4,230,919, Cl. 200-67.00B.
Schaudek, Ernest F.: *See*—
Nasiatka, John R.; Austin, Ronald; and Schaudek, Ernest F., 4,230,249, Cl. 227-123.000.
Scheben, Quirin: *See*—
Renner, Gunter; and Scheben, Quirin, 4,230,851, Cl. 544-183.000.
Scheerer, Wolfgang, to A. Ehrenreich GmbH & Co. KG. Ball-joint with locking device. 4,230,415, Cl. 403-122.000.
Scheibler Peltzer GmbH & Co.: *See*—
Schneider, Axel, 4,230,287, Cl. 242-77.100.
Scheinpflug, Hans: *See*—
Oeckl, Siegfried; Scheinpflug, Hans; and Kraus, Peter, 4,230,723, Cl. 424-302.000.
Schell, Paul F., to Maytag Company, The. Appliance door decorator panel construction. 4,229,921, Cl. 52-506.000.
Scherbakov, Ivan I.: *See*—
Sharonov, Mikhail A.; Zainullin, Lik A.; Olginsky, Felix Y.; Scherbakov, Ivan I.; Kolpakov, Serafim V.; and Teder, Leonid I., 4,230,477, Cl. 65-141.000.
Schering Aktiengesellschaft: *See*—
Schopflin, Gisela; Fuchs, Peter; and Kolb, Karl H., 4,230,686, Cl. 424-22.000.
Schering Corporation: *See*—
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,230,847, Cl. 536-10.000.
Neustadt, Bernard R., 4,230,635, Cl. 260-556.00A.
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,230,799, Cl. 435-76.000.
Scheu, William E., Jr. Solder extractor. 4,230,250, Cl. 228-20.000.
Schexnayder, Lawrence F.: *See*—
Bianchetta, Donald L.; and Schexnayder, Lawrence F., 4,230,022, Cl. 91-516.000.
Schiff, Sidney: *See*—
Bonazza, Benedict R.; and Schiff, Sidney, 4,230,588, Cl. 252-51.50A.
Schiller, August: *See*—
Sommer, Oswin; Schiller, August; Dorsch, Norman; and Strasser, Alois, 4,230,826, Cl. 525-100.000.
Schilz, Duane K. Stay nail bar. 4,230,303, Cl. 254-212.000.
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., to PPG Industries, Inc. Novel pigment grinding vehicle. 4,230,552, Cl. 204-181.00C.
Schirmer, Joseph P.: *See*—
Broughton, Roy M., Jr.; Callander, Douglas D.; Pengilly, Brian W.; Schirmer, Joseph P.; and Winters, Terence E., 4,230,818, Cl. 528-272.000.
Schlueter, Francis E.; Copley, Russell D.; and Sanderson, Leon F., to Deere & Company. Hydraulic height sensing system with cylinder by-pass. 4,229,931, Cl. 56-10.200.
Schmalz, Roman, to Logemann Brothers Company. Apparatus for processing metal material into bales. 4,230,037, Cl. 100-95.000.
Schmid-Appenzelier, Kathe Anna, heir: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Schmid, Bruce K.: *See*—
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Schmid-Gautschi, Ernst Georges, heir: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Schmid, Hans, deceased: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Schmid-Suter, Maria Albertine, heir: *See*—
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.
Schneerson, Moshe; and Kofman, Anatoli. Locking mechanism and locks incorporating said mechanism. 4,229,957, Cl. 70-134.000.
Schneider, Axel, to Scheibler Peltzer GmbH & Co. Apparatus for the mechanical needling of pile fabrics. 4,230,287, Cl. 242-77.100.
Schneider, Daniel E. Method and apparatus for effecting the prospective forewarning diagnosis of sudden brain death and heart death and other brain-heart-body growth maladies such as schizophrenia and cancer and the like. 4,230,125, Cl. 128-670.000.
Schneider, Eugene. Foil web for filling automats with a removal apparatus. 4,230,760, Cl. 428-195.000.

Schneider, Fernand: *See—*
Bernauer, Karl; Pfoertner, Karlheinz; Schneider, Fernand; Schmid, Hans, deceased; Baumann-Schmid, Mary Margrith, heir; Schmid-Suter, Maria Albertine, heir; Wawrla-Schmid, Jeannette Martha, heir; and Schmid-Gautschi, Ernst Georges, heir, 4,230,623, Cl. 260-326.5SM.

Schneider, Mark R.; and Wickwar, Larry D., to Fairchild Camera and Instrument Corporation. Low-cost watch case and band. 4,229,936, Cl. 368-282.000.

Schnitzius, Klaus, to Stabilus GmbH. Gas spring with automatic locking mechanism. 4,230,309, Cl. 267-120.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,230,627, Cl. 260-397.200.

Scholl, Hans-Joachim; and Zenner, Armin, to Bayer Aktiengesellschaft. Process for the preparation of urethanes. 4,230,876, Cl. 560-25.000.

Schoolar, Richard B., to United States of America, Navy. High electrical frequency infrared detector. 4,231,053, Cl. 357-30.000.

Schoot, Cornelis J.: *See—*
de Bont, Marinus R. J.; Kivits, Petrus J.; Schoot, Cornelis J.; and Zalm, Pieter, 4,230,939, Cl. 235-488.000.

Schopflin, Gisela; Fuchs, Peter; and Kolb, Karl H., to Schering Aktiengesellschaft. Drug excipient of silicone rubber. 4,230,686, Cl. 424-22.000.

Schott, Charles M., Jr., to Gloucester Engineering Co., Inc. Cutting assembly useful in bag machines. 4,230,029, Cl. 93-33.00H.

Schreck, Raymond M.: *See—*
Griffin, James R.; and Schreck, Raymond M., 4,229,945, Cl. 62-229.000.

Schroeder, Arnold: *See—*
Hansma, Hendrik; and Schroeder, Arnold, 4,230,889, Cl. 568-559.000.

Schroeder, Thaddeus; and Traub, Norman L., to General Motors Corporation. Vehicle window glass breakage detector. 4,230,918, Cl. 200-61.620.

Schubert, Jurgen: *See—*
Lohrberg, Karl; Pfohl, Rainer; Schubert, Jurgen; and Gritschke, Martin, 4,230,569, Cl. 210-754.000.

Schuegraf, Eberhard, to Siemens Aktiengesellschaft. Antenna feed system for double polarization. 4,231,000, Cl. 333-109.000.

Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., to UMC Industries, Inc. Vendor control circuit. 4,231,105, Cl. 364-900.000.

Schultz, Peter C., to Corning Glass Works. Method of forming a substantially continuous optical waveguide. 4,230,472, Cl. 65-3.00A.

Schultz, William J.; and Van Bennekom, Carl F., to General Electric Company. Method of mounting a pivot insert. 4,229,874, Cl. 29-432.000.

Schut, Robert N.: *See—*
Kotick, Michael P.; Schut, Robert N.; Polazzi, Joseph O.; and Leland, David L., 4,230,712, Cl. 424-260.000.

Schutz, Heinrich: *See—*
Kastl, Johann; and Schutz, Heinrich, 4,230,410, Cl. 366-177.000.

Schwee, Leonard J.; Irons, Henry R.; and Anderson, Wallace E., to United States of America, Navy. Serriform strip crosstie memory. 4,231,107, Cl. 365-87.000.

Schweitzer, Reinhard: *See—*
Heller, Wilhelm; Knoor, Walter; and Schweitzer, Reinhard, 4,230,488, Cl. 75-123.00F.

Schwemmer, Leonard J., to Lord Corporation. Joint prosthesis. 4,229,839, Cl. 3-1.910.

Schwerdhofer, Hans-Joachim, to Fichtel & Sachs A.G. Multiple speed hub for a bicycle with centrifugally controlled speed change and override mechanism actuated by back pedaling. 4,229,997, Cl. 74-752.00E.

Schwetz, Karl A.; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Dense sintered shaped articles of polycrystalline α-silicon carbide and process for their manufacture. 4,230,497, Cl. 106-44.000.

Science Applications, Inc.: *See—*
McCarthy, Harry E., 4,230,367, Cl. 299-2.000.

Scott, Ward: *See—*
McKee, Clyde M.; and Scott, Ward, 4,229,992, Cl. 74-501.00M.

Scott, William R.: *See—*
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.

Scovill Manufacturing Company: *See—*
Ward, Charles W., 4,230,023, Cl. 92-5.00L.

Seaberg, Richard D., to Cascade Corporation. Lift truck load-handling attachment having integral quick-disconnect hook. 4,230,434, Cl. 414-607.000.

Sealey, Francis; and Steadman, Stephen T., to Boeing Commercial Airplane Company. Decompression release door latch and stop. 4,230,352, Cl. 292-341.170.

Sech, Charles E. Method for the distillation purification of organic heat transfer fluids. 4,230,536, Cl. 203-89.000.

Sehgal, Surendra N.; and Vezina, Claude, to Ayerst McKenna & Harrison, Inc. Ravidomycin and process of preparation. 4,230,692, Cl. 424-122.000.

Seibel, Peter: *See—*
Eichhorn, Wilfried; and Seibel, Peter, 4,230,643, Cl. 525-253.000.

Seibert, Karl: *See—*
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,230,612, Cl. 260-33.20R.

Seidman, Jack: *See—*
Rowling, Sidney, 4,229,926, Cl. 53-429.000.

Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Radio station system. 4,231,116, Cl. 455-87.000.

Seko, Maomi; Miyake, Tetsuya; Takeuchi, Hiroshi; and Tanouchi, Masatoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of a high purity terephthalic acid. 4,230,882, Cl. 562-416.000.

Semplak, Ralph A., to Bell Telephone Laboratories, Incorporated. Technique for reducing near-in sidelobes of an offset antenna. 4,231,043, Cl. 343-786.000.

Sensor Corporation: *See—*
Mordwinkin, George, 4,230,987, Cl. 324-236.000.

Sentisi, Joseph C.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Sentisi, Joseph C., 4,230,549, Cl. 204-159.170.

Senyei, Andrew E.; and Widder, Kenneth J., to Northwestern University. Method of magnetic separation of cells and the like, and microspheres for use therein. 4,230,685, Cl. 424-12.000.

Separex Teknik AB: *See—*
Westberg, Johan E. H., 4,230,263, Cl. 233-23.00R.

Sequeira, Avilino, Jr.; and Barger, Frank L., to Texaco Inc. Control system for an MP refining unit receiving medium sweet charge oil. 4,230,215, Cl. 196-46.000.

Serac S.A.: *See—*
Graffin, Jean-Jacques, 4,230,195, Cl. 177-1.000.

Setera, Ronald J.: *See—*
Lewine, Donald A.; Dundon, Thomas M.; and Setera, Ronald J., 4,231,089, Cl. 364-200.000.

Seto, Rodney K. M.; Brickman, Eugene L.; and Fitzgibbons, Michael R., to TRW Inc. Methods and apparatus for sensing wellhead pressure. 4,230,187, Cl. 166-362.000.

Shackle, Dale R.: *See—*
Lee, Yu-Sun; and Shackle, Dale R., 4,230,495, Cl. 106-14.500.

Shaparew, Valadimir. Bee escape board. 4,229,848, Cl. 6-4.00B.

Sharonov, Mikhail A.; Zainullin, Lik A.; Olginsky, Felix Y.; Scherbakov, Ivan I.; Kolpakov, Serafim V.; and Teder, Leonid I. Apparatus for granulating molten slag. 4,230,477, Cl. 65-141.000.

Sharp Kabushiki Kaisha: *See—*
Aiba, Masahiko, 4,231,046, Cl. 346-75.000.
Tanimoto, Akira, 4,231,098, Cl. 364-708.000.
Tsuji, Sigeki; Shiozaki, Hiromichi; and Yamasaki, Eiji, 4,230,323, Cl. 274-9.0RA.

Sharpe, Raymond, to Lucas Industries Limited. Axial loading device. 4,229,986, Cl. 74-200.000.

Shatto, Walter C., Jr.: *See—*
Fornwalt, Robert G.; and Shatto, Walter C., Jr., 4,230,008, Cl. 83-456.000.

Shaw, Joy D. Padded undergarment for physical fitness. 4,229,835, Cl. 2-406.000.

Shawl, Edward T.; and Bullano, Gerald A., to Atlantic Richfield Company. Method for increasing the 4,4'dicarbamate isomer of the diphenylmethane dicarbamates during preparation thereof. 4,230,877, Cl. 560-25.000.

Sheely, Harold R.; Oricchio, F. Frederick; and Ferrari, Domenic C., to Badger Company, Inc., The. Process and apparatus for producing halogenated unsaturated hydrocarbons. 4,230,668, Cl. 422-140.000.

Shell Oil Company: *See—*
Blytas, George C., 4,230,184, Cl. 166-312.000.
Peterson, Larry W., 4,230,482, Cl. 71-93.000.
Roman, Steven A., 4,230,863, Cl. 546-246.000.
Verbrugge, Pieter A.; Kramer, Petrus A.; Van Berkel, Johannes; and Kelderman, Hendrik C., 4,230,891, Cl. 568-591.000.

Shemer, Michael; McDonald, Richard E.; and Chen, Anthony H., to Miles Laboratories, Inc. Process for preparing textured protein concentrate. 4,230,738, Cl. 426-656.000.

Shepherd, Robert G., to American Cyanamid Company. 4-[(Carboxyl- and sulfamyl-substituted alkyl)-amino] benzoic acids and analogs. 4,230,628, Cl. 260-404.000.

Shepherd, Robert G., to American Cyanamid Company. Hypolipidemic and antiatherosclerotic 4-[(cyclopropyl alkyl)amino]benzoic acids and derivatives. 4,230,878, Cl. 560-48.000.

Sheyon, Gregory M., to Stauffer Chemical Company. Pressure sensitive composite article. 4,230,753, Cl. 428-40.000.

Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for calculating a plurality of interpolation values. 4,231,097, Cl. 364-577.000.

Shigehara, Itaru: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Tsujii, Yasuhiro; and Shigehara, Itaru, 4,230,642, Cl. 570-193.000.

Shikoku Kakooki Co., Ltd.: *See—*
Ayaha, Kyuhei, 4,230,217, Cl. 198-397.000.

Shimano Industrial Company, Limited: *See—*
Fujimoto, Hideaki, 4,229,987, Cl. 474-82.000.
Tsuchie, Kimihiro; and Harada, Takafumi, 4,230,212, Cl. 192-64.000.

Shimizu, Takao: *See—*
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.

Shimizu, Takeo: *See—*
Itoh, Tsutomu; Ouchi, Kenji; Furuya, Nobuo; and Shimizu, Takeo, 4,230,068, Cl. 118-634.000.

Shimizu, Yoichi, to Kabushiki Kaisha Maruyama Seisakusho. Heddle frame. 4,230,159, Cl. 139-91.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio; and Kumagae, Kimitaka, 4,230,815, Cl. 526-335.000.

Shiozaki, Hiromichi: *See*—
Tsuji, Sigeki; Shiozaki, Hiromichi; and Yamasaki, Eiji, 4,230,323, Cl. 274-9.0RA.
Shirasu, Hirotoshi: *See*—
Kosugi, Hiroshi; Inoue, Hirofumi; and Shirasu, Hirotoshi, 4,231,022, Cl. 340-347.0DA.
Sholl, Howard A.; and Marshall, John T., to Dapco Industries, Inc. System for selectably pulsing ultrasonic transducers in a test apparatus. 4,229,978, Cl. 73-626.000.
Short, Larry E.: *See*—
Divins, Larry A.; and Short, Larry E., 4,230,672, Cl. 422-159.000.
Showa Denko K.K.: *See*—
Kawasaki, Keiji; and Matsuda, Itsuaki, 4,230,543, Cl. 204-98.000.
Showa Musen Kogyo Kabushiki Kaisha: *See*—
Mochizuki, Asaji, 4,230,916, Cl. 200-6.00A.
Shrader, Donald R.: *See*—
Hill, Herbert M.; and Shrader, Donald R., 4,230,281, Cl. 241-142.000.
Siegel, Stephen L.: *See*—
Burnstein, Philip J.; Pariza, George R.; and Siegel, Stephen L., 4,230,383, Cl. 339-17.00R.
Siemens Aktiengesellschaft: *See*—
Bechteler, Martin, 4,231,034, Cl. 340-765.000.
Berg, Hermann O.; Gulden, Peter; Kostka, Hana; and Michel, Alfred, 4,230,443, Cl. 431-328.000.
Distler, Walter; and Heinzelmann, Karl-Georg, 4,230,949, Cl. 250-445.00T.
Knauer, Karl, 4,230,952, Cl. 307-221.00D.
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,231,002, Cl. 333-165.000.
Meixner, Hans, 4,230,935, Cl. 219-523.000.
Rambold, Klaus, 4,230,981, Cl. 323-25.000.
Schuegraf, Eberhard, 4,231,000, Cl. 333-109.000.
Storck, Eckhard; and Wolff, Ulrich, 4,230,948, Cl. 250-445.00T.
Wengler, Christian; and Vogt, Herbert, 4,230,901, Cl. 174-52.0PE.
Zoeke, Siegfried, 4,230,409, Cl. 355-55.000.
Siemonsen, Hans-Pieter: *See*—
Roth, Mario; Winandy, Johann; and Siemonsen, Hans-Pieter, 4,230,474, Cl. 65-114.000.
Sihi GmbH & Co. KG: *See*—
Lehmann, Wilfried; Muller, Hermann; and Baranek, Bodo, 4,230,438, Cl. 415-122.00R.
Simmonds, Robin G.: *See*—
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,709, Cl. 424-256.000.
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,230,716, Cl. 424-273.00R.
Simmonds, S.A.: *See*—
Layeillon, Jacques, 4,230,166, Cl. 151-7.000.
Simokat, Frank L., to TII Corporation. Signalling and channel loop test circuits for station carrier telephone system. 4,230,910, Cl. 370-71.000.
Simon, Eli. Self-extinguishing cigarettes. 4,230,131, Cl. 131-4.00A.
Simpson Manufacturing Co., Inc.: *See*—
Gilb, Tyrell T., 4,230,416, Cl. 403-232.100.
Singer Company, The: *See*—
Warner, Richard C., 4,231,023, Cl. 340-347.0DD.
Singh, Prithipal; and Hu, Mae W., to Syva Company. Theophylline antigens and antibodies. 4,230,805, Cl. 435-188.000.
Sintokogio Ltd.: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,230,172, Cl. 164-192.000.
Sirota, Julius, to National Starch and Chemical Corporation. Primers for polymerizable acrylate-chlorosulfonated polyethylene adhesives and two-part adhesives prepared therewith. 4,230,834, Cl. 525-308.000.
Sittig, Roland: *See*—
Ruetsch, Christian; and Sittig, Roland, 4,231,054, Cl. 357-38.000.
Skakodub, Vladimir A.: *See*—
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.
Skidmore, Paul E. Funnel employing tool for removing plug and draining oil from vehicle oil pan. 4,230,002, Cl. 81-121.00R.
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; and Peresada, Vitaly P. 1,2,3,4-Tetrahydropyrrolo-[1,2-a]-pyrazine. 4,230,856, Cl. 544-349.000.
Skolnick, Barry, to Saxon Industries, Inc. Open weave drapery fabric in association with a solar light-control film. 4,230,763, Cl. 428-246.000.
Slack, Keith K.: *See*—
Hammer, William E.; Lewis, David O.; Reed, John W.; Robinson, Thomas S.; and Slack, Keith K., 4,231,088, Cl. 364-200.000.
Slapshak, Louis F.: *See*—
Ehrenthal, Irving; Slapshak, Louis F.; and Rajpara, Jagdish, 4,230,802, Cl. 435-94.000.
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B. Plant for collecting and briquetting domestic waste. 4,229,946, Cl. 62-341.000.
Small, Marvin: *See*—
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,230,243, Cl. 222-402.180.
Smart, Richard C. Convertible railway velocipede. 4,230,046, Cl. 105-95.000.
Smilgys, Bruno S., to Veeder Industries, Inc. Fuel delivery safety limit mechanism. 4,230,937, Cl. 235-94.00R.
Smith, Forrest D. Augmented bubble blower device. 4,229,902, Cl. 46-6.000.
Smith, Fred T., to Sargent Industries, Inc. Front end loader. 4,230,359, Cl. 296-101.000.
Smith, James D. B.; Phillips, D. Colin; and Grossett, Kenneth W., to Westinghouse Electric Corp. Petroleum and synthetic grease thermoparticulating coating. 4,229,974, Cl. 73-339.00R.
Smith, Joseph P., Jr.; Mentzer, Robert L.; and Freberg, Dana D., to General Electric Company. Air delivery system for regulating thermal growth. 4,230,439, Cl. 415-138.000.
Smith, Kenneth R., to Mallinckrodt, Inc. Polyhydroxy-alkyl-3,5-disubstituted-2,4,6-triiodocarbanilates. 4,230,845, Cl. 536-4.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,230,865, Cl. 548-138.000.
Smith, Mildred E. Family relationships card game. 4,230,321, Cl. 273-308.000.
Smith, Philip E. Syringe-type liquid container dispenser adapter. 4,230,112, Cl. 128-272.300.
Smith, Trevor S., to Lucas Industries Limited. Shut-off valve arrangements for fluids. 4,229,937, Cl. 60-39.28R.
Smith, Trevor S., to Lucas Industries Limited. Fuel control for a gas turbine engine reheat system. 4,229,939, Cl. 60-243.000.
Smith, William C., to Rader Companies, Inc. Apparatus for pneumatically separating fractions of a particulate material. 4,230,559, Cl. 209-139.00R.
Smoky Mountain Enterprises, Inc.: *See*—
Buckner, Carrol E., 4,230,093, Cl. 126-190.000.
Snamprogetti S.p.A.: *See*—
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,230,562, Cl. 210-610.000.
Romano, Ugo; and Rivetti, Franco, 4,230,881, Cl. 560-193.000.
Snead, Edwin D. Load weighing and accumulating system and method for hydraulic loader. 4,230,196, Cl. 177-141.000.
Snell, Thomas B. Crop spraying apparatus. 4,230,272, Cl. 239-121.000.
Snow, Kenneth T.; and Snow, Kenneth T., Jr. Corner bracket with saddle for hip rafters of buildings. 4,229,915, Cl. 52-92.000.
Snow, Kenneth T., Jr.: *See*—
Snow, Kenneth T.; and Snow, Kenneth T., Jr., 4,229,915, Cl. 52-92.000.
Snowden, Jimmy C. Muzzle loading apparatus. 4,229,897, Cl. 42-90.000.
Snyder, Phillip S.: *See*—
Mitchell, William T.; and Snyder, Phillip S., 4,230,887, Cl. 562-593.000.
Sobolev, Vyacheslav G.: *See*—
Bykhovsky, David G.; and Sobolev, Vyacheslav G., 4,229,873, Cl. 29-420.000.
Societa Farmaceutici Italia S.p.A.: *See*—
Beacco, Enzo; Bianchi, Maria L.; Minghetti, Annacleto; and Spalla, Celestino, 4,230,854, Cl. 544-346.000.
Societe Anonyme DBA: *See*—
Volan, Gerard; and Carre, Jean-Jacques, 4,231,012, Cl. 340-52.00A.
Societe Anonyme de Telecommunications: *See*—
Lindebrings, Charles M. P.; Vaillagou, Pierre; and Velte, Andre J. F., 4,229,879, Cl. 29-840.000.
Societe Anonyme dite: Compagnie Generale d'Electricite: *See*—
Jacquelin, Jean, 4,230,780, Cl. 429-104.000.
Societe Civile Promeyrat-Casteilia-Techniques Nouvelles du Moteur: *See*—
Promeyrat, Maurice J., 4,230,027, Cl. 92-159.000.
Societe de Recherches Techniques et Industrielles: *See*—
Bonmati, Reynald; Roz, Bernard; and Tollet de Santerre, Henri, 4,230,464, Cl. 55-23.000.
Societe Miniere et Metallurgique de Penarroya: *See*—
Demarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,230,487, Cl. 75-101.00R.
Societe Nationale Elf Aquitaine: *See*—
Bonmati, Reynald; Roz, Bernard; and Tollet de Santerre, Henri, 4,230,464, Cl. 55-23.000.
Sokolov, Alexandr D.: *See*—
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.
Solarex Corporation: *See*—
Lindmayer, Joseph, 4,230,508, Cl. 148-186.000.
Solari, Ray L. Safety goggles. 4,229,837, Cl. 2-431.000.
Solwin Industries, Inc.: *See*—
Hope, Charles S., 4,229,941, Cl. 60-641.000.
Sommer, Oswin; Schiller, August; Dorsch, Norman; and Strasser, Alois, to Wacker-Chemie GmbH. Organopolysiloxane compositions and elastomers formed therefrom. 4,230,826, Cl. 525-100.000.
Sommer, Ruediger: *See*—
Wellendorf, Klaus; and Sommer, Ruediger, 4,231,069, Cl. 358-256.000.
Sommerkamp, Peter: *See*—
Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, 4,230,739, Cl. 427-42.000.
Sopoic, Mirko: *See*—
Zupancic, Boris; and Sopoic, Mirko, 4,230,884, Cl. 562-460.000.
Sorensen, Ebbe N.: *See*—
Larsen, Christian; Frederiksen, Per D.; and Sorensen, Ebbe N., 4,230,157, Cl. 138-155.000.

Sorenson, Roderick J.: *See*—
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,230,707, Cl. 424-251.000.
Sorochinsky, Alexandr P.: *See*—
Gusev, Vladimir A.; Oprisko, Jury I.; and Sorochinsky, Alexandr P., 4,230,425, Cl. 405-239.000.
Souma, Akio: *See*—
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, 4,230,168, Cl. 152-310.000.
Southard, Albert A. Rotary internal combustion engine with integrated supercharging. 4,230,088, Cl. 123-203.000.
Southco, Inc.: *See*—
Bisbing, Robert H., 4,230,351, Cl. 292-223.000.
Southwire Company: *See*—
Hartman, George J.; and Ewing, Vernon R., 4,230,678, Cl. 423-112.000.
Spacek, Jindrich; and Kosek, Jiri, to Vyzkumny ustav tvarecich stroju a technologie. Hydraulic circuit of a hydromechanical drawing press. 4,229,965, Cl. 72-453.130.
Spalla, Celestino: *See*—
Beacco, Enzo; Bianchi, Maria L.; Minghetti, Annacleto; and Spalla, Celestino, 4,230,854, Cl. 544-346.000.
Sparkes, Curtis A., to Lamondine S.A. Wheel support arrangements. 4,229,856, Cl. 16-47.000.
Spars, Byron G.: *See*—
Bertelsen, Corey A.; and Spars, Byron G., 4,230,557, Cl. 208-8.00R.
Spector, George: *See*—
Geeslin, John W.; and Spector, George, 4,230,106, Cl. 128-201.110.
Speet, Larry A., to Steelcase Inc.,. Power pole assembly. 4,230,900, Cl. 174-48.000.
Speier, Klaus: *See*—
Disselbeck, Dieter; Hilscher, Eduard; and Speier, Klaus, 4,230,175, Cl. 165-46.000.
Spencer, Boyd L., to Spencer Heads, Inc. Method of repairing or modifying the firing deck of an internal combustion engine. 4,229,867, Cl. 29-156.40R.
Spencer Heads, Inc.: *See*—
Spencer, Boyd L., 4,229,867, Cl. 29-156.40R.
Spencer, Robert W.: *See*—
Falcone, James S., Jr.; and Spencer, Robert W., 4,230,496, Cl. 106-14.210.
Sperry Rand Corporation: *See*—
Heap, David L.; and Kenner, Allen L., 4,231,106, Cl. 364-900.000.
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., to U.S. Philips Corporation. Method of manufacturing an external electrically conducting metal pattern. 4,230,788, Cl. 430-153.000.
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C. Aerosol container with flameless delivery valve. 4,230,243, Cl. 222-402.180.
Sprague Electric Company: *See*—
Maher, John P.; and Kam-Lum, Elsa, 4,230,754, Cl. 428-76.000.
Markarian, Mark; and Meyer, Kenneth B., 4,231,076, Cl. 361-433.000.
Sprecher & Schuh AG: *See*—
Thaler, Richard, 4,230,920, Cl. 200-148.00A.
Spring, Carl E., to La Crosse Cooler Company, Inc. Liquid rejecting coin chute. 4,230,213, Cl. 194-1.00K.
Spring, David J.: *See*—
Rowsell, David G.; Spring, David J.; and Hems, Roger, 4,230,688, Cl. 424-45.000.
Springett, Charles N.; Abramovich, Dan; Uyeda, Stanley T.; and Radu, E. John, to Santa Fe International Corporation. Self propelled dynamically positioned reel pipe laying ship. 4,230,421, Cl. 405-168.000.
Springrose, James V.: *See*—
Gordon, Robert; Weingart, Oscar; King, Harry A.; and Springrose, James V., 4,230,048, Cl. 105-248.000.
SPS Technologies, Inc.: *See*—
Crispell, Corey F., 4,229,875, Cl. 29-452.000.
Spurrier, Francis R., to United States of America, Energy. Magnetohydrodynamic (MHD) channel corner seal. 4,230,959, Cl. 310-11.000.
Stabilus GmbH: *See*—
Schnitzius, Klaus, 4,230,309, Cl. 267-120.000.
Stablex A.G.: *See*—
Chappell, Christopher L., 4,230,568, Cl. 210-751.000.
Stahl, Kurt. Disc brake pad. 4,230,207, Cl. 188-73.100.
Staiert, Richard W., to International Harvester Company. Combine grain loss sensing. 4,230,130, Cl. 130-27.00R.
Stainless Icetainer Company: *See*—
Rhoades, John P., 4,230,381, Cl. 312-295.000.
Stal-Laval Apparat AB: *See*—
Berkestad, Karl-Erik, 4,230,177, Cl. 165-67.000.
Stal Refrigeration AB: *See*—
Brandin, Tore, 4,229,949, Cl. 62-503.000.
Staley, Gary M.; and Cox, Monty S. Holding device for hunting equipment. 4,230,296, Cl. 248-309.00R.
Stanadyne, Inc.: *See*—
Behnke, Robert C., 4,230,491, Cl. 75-243.000.
Standard Oil Company (Indiana): *See*—
Lewis, Harry R., Jr., 4,230,186, Cl. 166-342.000.
Standard Oil Company (Ohio): *See*—
Paspek, Stephen C.; and Every, William A., 4,230,888, Cl. 562-600.000.
Stanton, David J., to Medtronic, Inc. Electrical body stimulator. 4,230,121, Cl. 128-422.000.
Stanton, Leo F., to Bush Universal, Inc. Method for stiffening shoe insoles. 4,229,851, Cl. 12-146.00S.
Stauers, Juris, to Motorola, Inc. Digital function generator. 4,231,099, Cl. 364-718.000.
Stauffer Chemical Company: *See*—
Felix, Raymond A., 4,230,483, Cl. 71-100.000.
Lauck, Robert M., 4,230,730, Cl. 426-128.000.
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,230,874, Cl. 560-12.000.
Sheyon, Gregory M., 4,230,753, Cl. 428-40.000.
Walker, Francis H., 4,230,720, Cl. 424-278.000.
Wei, Chung H., 4,230,832, Cl. 525-260.000.
Stauffer, Norman L., to Honeywell Inc. Corrector lens. 4,230,941, Cl. 250-204.000.
Stauffer, Norman L., to Honeywell Inc. Crossed cylindrical lens. 4,230,942, Cl. 250-204.000.
Steadman, Stephen T.: *See*—
Sealey, Francis; and Steadman, Stephen T., 4,230,352, Cl. 292-341.170.
Stedman, Robert N., to Caterpillar Tractor Co. Apparatus for shifting center of gravity of a work vehicle. 4,230,199, Cl. 180-9.20R.
Steelcase Inc.,: *See*—
Speet, Larry A., 4,230,900, Cl. 174-48.000.
Steere, William C.; and Wilson, Stephen S., to Agro Sciences, Inc. Seed viability analyzer. 4,230,983, Cl. 324-71.00R.
Steinbach, Irving H., to Glen Manufacturing Company. Automatic thread wiper for sewing machines. 4,230,056, Cl. 112-239.000.
Steinberg, Hans; and Sudhoff, Wolfgang, to Mannesmann Aktiengesellschaft. Transmission of ships. 4,229,990, Cl. 74-377.000.
Steinbrecher Corporation: *See*—
Steinbrecher, Donald H., 4,230,956, Cl. 307-257.000.
Steinbrecher, Donald H., to Steinbrecher Corporation. Doubly balanced mixer with optimized dynamic range. 4,230,956, Cl. 307-257.000.
Stelting, Raymond B., to Hewlett-Packard Company. Resistance neutralizing system for electrochemical devices. 4,230,988, Cl. 324-439.000.
Stemme, Otto: *See*—
Wick, Richard; Stemme, Otto; Lermann, Peter; Wagner, Karl; Borowski, Kurt; Cocron, Istvan; and Fauth, Gunter, 4,230,400, Cl. 354-25.000.
Stephan, Herbert: *See*—
Aichert, Hans; Dietrich, Walter; Hauff, Alfred; Sommerkamp, Peter; and Stephan, Herbert, 4,230,739, Cl. 427-42.000.
Stephenson, Robert L., to Allied Chemical Corporation. Passive seat belt system. 4,230,342, Cl. 280-803.000.
Stern, Robert: *See*—
Cosyns, Jean; Stern, Robert; and Le Page, Jean-Francois, 4,230,897, Cl. 585-260.000.
Stewart, William S., to Phillips Petroleum Company. Control of a fractional distillation column. 4,230,534, Cl. 203-1.000.
Stewich, Max W., to RCA Corporation. Charge-coupled device imager system. 4,231,062, Cl. 358-109.000.
Stichting Rega V.Z.W.: *See*—
De Clercq, Erik; and Holy, Antonin, 4,230,708, Cl. 424-253.000.
Stierlen-Maquet Aktiengesellschaft: *See*—
Junginger, Klaus M.; and Kieferle, Hermann, 4,231,019, Cl. 340-171.00R.
Stinehelfer, Jonathan J., to Fairchild Camera and Instrument Corp. Memory array with sequential row and column addressing. 4,231,110, Cl. 365-194.000.
Stinger, William. Face shield/helmet airflow noise reducer. 4,229,836, Cl. 2-422.000.
Stirniman, James P. Skein and ball banding machine. 4,229,925, Cl. 53-399.000.
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D. Collapsible fifth wheel trailer hitch locked position indicator. 4,230,430, Cl. 410-59.000.
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D. Tractor operated fifth wheel hitch stand diagonal strut linkage. 4,230,431, Cl. 410-59.000.
Storandt, Ralf, to Verrinigte Baubeschlagfabriken Gretsch Co. GmbH. Ski bindings and ski brakes associated therewith. 4,230,337, Cl. 280-605.000.
Storck, Eckhard; and Wolff, Ulrich, to Siemens Aktiengesellschaft. Arrangement for the production of x-ray sectional pictures. 4,230,948, Cl. 250-445.00T.
Stormont, Richard W.: *See*—
Taylor, Aaron S.; and Stormont, Richard W., 4,230,674, Cl. 422-246.000.
Strasser, Alois: *See*—
Sommer, Oswin; Schiller, August; Dorsch, Norman; and Strasser, Alois, 4,230,826, Cl. 525-100.000.
Strauss, Edgars H.: *See*—
Langen, Marinus J. M.; and Strauss, Edgars H., 4,230,204, Cl. 186-66.000.
Strecker, Edgar: *See*—
Hanson, Violet M.; and Strecker, Edgar, 4,230,030, Cl. 93-35.0SB.
Stritzl, Karl: *See*—
Weigl, Erwin; and Stritzl, Karl, 4,230,338, Cl. 280-618.000.
Structural Composite Industries, Inc.: *See*—
Gordon, Robert; Weingart, Oscar; King, Harry A.; and Springrose, James V., 4,230,048, Cl. 105-248.000.
Strycker, Wallace G.: *See*—
Havera, Herbert J.; and Strycker, Wallace G., 4,230,710, Cl. 424-258.000.

Stumpp, Gerhard; and Banzhaf, Werner, to Robert Bosch GmbH. Device for exhaust gas recycling. 4,230,080, Cl. 123-568.000.

Sturges, James R.: *See*—
Purcell, Robert J.; and Sturges, James R., 4,230,378, Cl. 305-22.000.

Sturni, Lance C.: *See*—
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,230,552, Cl. 204-181.00C.

Suarez, Tulio; and Jones, C. David, to Eli Lilly and Company. Antifertility compounds. 4,230,862, Cl. 546-237.000.

Subbotin, Vladimir G.: *See*—
Meir, Vladimir A.; Zhukovsky, Alexei N.; Ponomarev, Vladimir S.; Subbotin, Vladimir G.; Kharitonov, Jury P.; Kusniruk, Vladimir F.; Anatychuk, Lukyan I.; Melnik, Anatoly P.; Skakodub, Vladimir A.; and Sokolov, Alexandr D., 4,230,945, Cl. 250-370.000.

Suchko, Adam J. Automatic improved engine control system containing both solid state circuits and relays. 4,231,073, Cl. 361-1.000.

Sudhoff, Wolfgang: *See*—
Steinberg, Hans; and Sudhoff, Wolfgang, 4,229,990, Cl. 74-377.000.

Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, to Sumitomo Chemical Company, Limited. Triazinyl-antraquinone dyes. 4,230,852, Cl. 544-189.000.

Sugimoto, Atsumi: *See*—
Ito, Yutaka; Inoue, Yuzo; Shimizu, Takao; Inaba, Masao; Sugimoto, Atsumi; and Emori, Takeo, 4,231,063, Cl. 358-148.000.

Sugimura, Norboru: *See*—
Makino, Shigeo; Sugimura, Norboru; and Aoki, Shigeta, 4,230,512, Cl. 152-209.00R.

Sullaway, Bob L., to Halliburton Company. Leg closure. 4,230,424, Cl. 405-227.000.

Sullivan. James R., to Power Conversion, Inc. Battery discharge level detection circuit. 4,231,026, Cl. 340-636.000.

Sulzer Brothers Ltd.: *See*—
Hintsch, Otto, 4,230,158, Cl. 139-1.00C.
Hintsch, Otto, 4,230,210, Cl. 192-28.000.
Janssen, Hermann J., 4,230,445, Cl. 431-116.000.

Sumi, Akiyasu: *See*—
Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, 4,230,403, Cl. 354-286.000.

Sumitomo Chemical Company, Limited: *See*—
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,230,725, Cl. 424-325.000.
Maruyama, Isamu; Aono, Shunji; and Katsube, Junki, 4,230,706, Cl. 424-251.000.
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,230,852, Cl. 544-189.000.

Sumitomo Electric Industries, Ltd.: *See*—
Mano, Hiroshi, 4,229,838, Cl. 3-1.400
Nagai, Shuzo; Watabe, Seiji; Ogino, Takao; and Okita, Koichi, 4,230,758, Cl. 428-141.000.
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.

Sumiyoshi, Masaharu: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,230,072, Cl. 123-1.00A.

Sun Chemical Corporation: *See*—
Horwitt, Laurence G.; and Mattis, Donald J., 4,230,931, Cl. 219-265.000.

Sun, Y. S. Edmund: *See*—
Chu, Hing C.; and Sun, Y. S. Edmund, 4,230,791, Cl. 430-296.000.

Sunkist Growers, Inc.: *See*—
Carter, Ned C.; Cramer, Jerry W.; and Bilton, Dennis E., 4,230,065, Cl. 118-17.000.

Sutch, Brian L. C., to Airfix Industries Limited. Method for forming a rupturable area in a container. 4,230,659, Cl. 264-266.000.

Sutton, Harold F.: *See*—
Alexander, Norman R.; and Sutton, Harold F., 4,229,834, Cl. 2-146.000.

Suzuki, Hajime: *See*—
Hamada, Hiroyuki; Ichikawa, Rinjiro; and Suzuki, Hajime, 4,230,768, Cl. 428-352.000.

Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, to Nippon Telegraph and Telephone Public Corporation; and Fujitsu Limited. Semiconductor integrated circuit device. 4,231,108, Cl. 365-174.000.

Suzuki, Satomi: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,229,998, Cl. 74-865.000.

Suzuki, Shigeyoshi: *See*—
Tsubai, Yasuo; Yoshida, Akio; and Suzuki, Shigeyoshi, 4,230,792, Cl. 430-302.000.

Suzuki, Takao: *See*—
Saruwatari, Kohichi; Isawa, Kazuo; Maejima, Masatsugu; and Suzuki, Takao, 4,230,539, Cl. 204-35.00N.

Suzuki, Yasoji; and Kouyama, Susumu, to Tokyo Shibaura Electric Co., Ltd. Wave shaping circuit. 4,230,951, Cl. 307-200.00B.

Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Watanabe, Tadaharu; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, to Teikoku Hormone Mfg. Co., Ltd. 11-Oxodibenz(b,e)azepines. 4,230,703, Cl. 424-244.000.

Svenska Aktiebolaget Bromsregulator: *See*—
Aurousseau, Andre; and Roger, Michel, 4,230,021, Cl. 91-461.000.

Svirschevsky, Valentin K.; Trofimuk, Andrei A.; Vasiliev, Gennady G.; and Leonov, Ivan P. Machine for making underground excavations. 4,230,191, Cl. 175-20.000.

Sweat, George B.; and Warren, Alvin E. Tree climbing apparatus. 4,230,203, Cl. 182-134.000.

Swift, Graham; Bartman, Benjamin; and Cenci, Harry J., to Rohm and Haas Company. Amine crosslinked methacrolein copolymers for coatings, binders and adhesives. 4,230,772, Cl. 428-442.000.

Swiss Aluminium Ltd.: *See*—
Nachbur, Roland; and Faisst, Dieter, 4,230,361, Cl. 296-193.000.

SWS Silicones Corporation: *See*—
Chapman, Dwain R., 4,230,632, Cl. 556-401.000.
Martin, Eugene R., 4,230,816, Cl. 528-12.000.

Sylvania Circuit Breaker Corporation: *See*—
Belttary, Harold E., 4,231,006, Cl. 335-36.000.

Sysoev, Vladimir S.: *See*—
Vydrin, Vladimir N.; Pastukhov, Valery V.; Barkov, Leonid A.; and Sysoev, Vladimir S., 4,229,961, Cl. 72-235.000.

Syva Company: *See*—
Singh, Prithipal; and Hu, Mae W., 4,230,805, Cl. 435-188.000.

Szucs, Laszlo: *See*—
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Orban, Jozsef, 4,230,020, Cl. 91-422.000.

Szulmayer, Wally, to Unisearch Limited. Solar concentrator. 4,230,094, Cl. 126-439.000.

Tada, Tetsuya. Trigger type sprayer with integrally formed locking nozzle cover. 4,230,277, Cl. 239-333.000.

Tadanier, John S.; and Martin, Jerry R., to Abbott Laboratories. 1,5-Carbamates of fortimicin B and derivatives. 4,230,846, Cl. 536-4.000.

Taguchi, Haruo: *See*—
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.

Takada, Juichiro. Passive vehicle passenger restraint belt system. 4,230,343, Cl. 280-803.000.

Takada, Kazuo: *See*—
Saito, Masao; Aoyama, Tetsuo; Horie, Shigeru; and Takada, Kazuo, 4,230,636, Cl. 260-561.00R.

Takahashi, Akira; and Takikawa, Toru, to Kabushiki Kaisha Osaka Packing Seizosho. Novel amorphous silica, and products thereof. 4,230,765, Cl. 428-283.000.

Takahashi, Satomi: *See*—
Yoneda, Koji; Ohashi, Takehisa; Nagamachi, Tomoaki; Fukumitsu, Hirotaka; and Takahashi, Satomi, 4,230,869, Cl. 548-314.000.

Takahashi, Shigeo: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,229,998, Cl. 74-865.000.

Takashima, Yuji: *See*—
Nishiguchi, Hisanori; Ishida, Eisuke; and Takashima, Yuji, 4,230,784, Cl. 430-42.000.

Takayama, Toshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, to Mitsubishi Petrochemical Company Limited; and Mitsubishi Yuka Pharmaceutical Co., Ltd. Process for producing a polysaccharide using *Pseudomonas polysaccharogenes* M-30. 4,230,800, Cl. 435-101.000.

Takeuchi, Hiroshi: *See*—
Seko, Maomi; Miyake, Tetsuya; Takeuchi, Hiroshi; and Tanouchi, Masatoshi, 4,230,882, Cl. 562-416.000.

Takewell, Robert B., to J. M. Huber Corporation. Process for pelletizing wet siliceous particulates. 4,230,458, Cl. 23-313.0AS.

Takikawa, Toru: *See*—
Takahashi, Akira; and Takikawa, Toru, 4,230,765, Cl. 428-283.000.

Tam, Matthias L.: *See*—
Custode, Frank Z.; and Tam, Matthias L., 4,231,051, Cl. 357-23.000.

Tamura, Akio: *See*—
Ohura, Yasushi; Ohwada, Susumu; Nakamura, Akira; Kitanishi, Mitsuo; Nakamura, Yakuharu; and Tamura, Akio, 4,230,209, Cl. 191-40.000.

Tamura, Jyoji, to Yamaha Hatsudoki Kabushiki Kaisha. V-belt type automatically variable transmission. 4,229,989, Cl. 474-12.000.

Tanaka, Hiroshi: *See*—
Iwaki, Takashi; Tanaka, Takeji; Tanaka, Yoshitomo; and Tanaka, Hiroshi, 4,230,058, Cl. 113-1.00R.

Tanaka, Hiroshige, to Nihon Sekiyu Hanbai Kabushiki Kaisha. Method of storing heavy hydrocarbon oil and vessel therefor. 4,230,138, Cl. 137-13.000.

Tanaka, Junzo; and Urashima, Chikao, to Matsushita Electric Industrial Co., Ltd. High voltage switch for cooking apparatus. 4,231,007, Cl. 335-131.000.

Tanaka, Katsufumi: *See*—
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.

Tanaka, Katsumi: *See*—
Hashimoto, Shigeru; Mitani, Taizo; Isobe, Takashi; Aoyagi, Masao; Sumi, Akiyasu; and Tanaka, Katsumi, 4,230,403, Cl. 354-286.000.

Tanaka, Takeji: *See*—
Iwaki, Takashi; Tanaka, Takeji; Tanaka, Yoshitomo; and Tanaka, Hiroshi, 4,230,058, Cl. 113-1.00R.

Tanaka, Taro: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,230,072, Cl. 123-1.00A.

Tanaka, Yoshitomo: *See*—
Iwaki, Takashi; Tanaka, Takeji; Tanaka, Yoshitomo; and Tanaka, Hiroshi, 4,230,058, Cl. 113-1.00R.
Tanimoto, Akira, to Sharp Kabushiki Kaisha. Casing of electronic calculators. 4,231,098, Cl. 364-708.000.
Taninbaum, Richard L. Tamborine. 4,230,015, Cl. 84-418.000.
Tanny, Stephen R.; and Blatz, Philip S., to Du Pont de Nemours, E. I., and Company. Adhesive blends containing thermally grafted ethylene polymer. 4,230,830, Cl. 525-222.000.
Tanouchi, Masatoshi: *See*—
Seko, Maomi; Miyake, Tetsuya; Takeuchi, Hiroshi; and Tanouchi, Masatoshi, 4,230,882, Cl. 562-416.000.
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., to Schering Corporation. Process for the preparation of antibiotic W-10 complex and for the isolation of Antibiotic 20561 and Antibiotic 20562 therefrom. 4,230,799, Cl. 435-76.000.
Tarbox, Bruce H.; Bruce, Kenneth E.; Conway, John W.; and Lombardo, Ralph M., Jr., to Honeywell Information Systems, Inc. Multiple CPU control system. 4,231,086, Cl. 364-200.000.
Tate, Ernest L. Freeze plug installation kit. 4,229,870, Cl. 29-254.000.
Taylor, Aaron S.; and Stormont, Richard W., to Mobil Tyco Solar Energy Corporation. Crucible-die assemblies for growing crystalline bodies of selected shapes. 4,230,674, Cl. 422-246.000.
Taylor, David L., to Harris Corporation. Moat resistor ram cell. 4,231,056, Cl. 357-50.000.
Taylor, David W., to General Motors Corporation. Method and apparatus for driving an air core gage. 4,230,984, Cl. 324-115.000.
Taylor, James B. Meter box assembly. 4,230,234, Cl. 220-18.000.
Taylor, John W., Jr., to Westinghouse Electric Corp. Constant false alarm rate radar system and method of operating the same. 4,231,005, Cl. 343-5.0NQ.
Taylor, Lauren P.; and Petroski, Alex, to LRS Research. Composting apparatus. 4,230,676, Cl. 422-62.000.
Taylor, Paul M.: *See*—
Kowall, James L.; and Taylor, Paul M., 4,230,227, Cl. 206-600.000.
Taylor, Robert S.; and Boyer, Norman W., to United States of America, Energy. Epoxy-borax-coal tar composition for a radiation protective, burn resistant drum liner and centrifugal casting method. 4,230,660, Cl. 264-311.000.
Teachout, Donald O., Sr. Gripping device and method. 4,229,924, Cl. 53-399.000.
Team Inc.: *See*—
Moore, Vonnie S., 4,230,348, Cl. 285-297.000.
Technion Research & Development Foundation Ltd.: *See*—
Cais, Michael, 4,230,664, Cl. 422-61.000.
Teder, Leonid I.: *See*—
Sharonov, Mikhail A.; Zainullin, Lik A.; Olginsky, Felix Y.; Scherbakov, Ivan I.; Kolpakov, Serafim V.; and Teder, Leonid I., 4,230,477, Cl. 65-141.000.
Teijin Limited: *See*—
Yamaji, Teizo; and Okitsu, Hiroyuki, 4,230,[illegible]5, Cl. 252-188.000.
Teikoku Hormone Mfg. Co., Ltd.: *See*—
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Watanabe, Tadaharu; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,230,703, Cl. 424-244.000.
Tektronix, Inc.: *See*—
Culter, Robert G., 4,231,060, Cl. 358-69.000.
Teledyne, Inc.: *See*—
Coulter, Leland E., 4,230,255, Cl. 228-184.000.
Telescope Folding Furniture Co., Inc., The: *See*—
Borichevsky, Donald J., 4,230,363, Cl. 297-184.000.
Teletype Corporation: *See*—
Haak, Gary R., 4,230,974, Cl. 315-399.000.
Templeton, William B., to Burroughs Corporation. Item sorter pocket flag and switch apparatus. 4,230,312, Cl. 271-215.000.
Ter Beek Hengelo (T.B.H.) B.V.: *See*—
ter Beek, Albertus; and ter Beek, Gerrit J., 4,230,934, Cl. 219-421.000.
Teradyne, Inc.: *See*—
St. Clair, Richard P., 4,231,104, Cl. 364-900.000.
Terao, Hisashige: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,230,852, Cl. 544-189.000.
ter Beek, Albertus; and ter Beek, Gerrit J., to Ter Beek Hengelo (T.B.H.) B.V. Internally heatable nozzle having a divisible housing and a divisible core. 4,230,934, Cl. 219-421.000.
ter Beek, Gerrit J.: *See*—
ter Beek, Albertus; and ter Beek, Gerrit J., 4,230,934, Cl. 219-421.000.
Terumo Corporation: *See*—
Ichikawa, Toshizi; and Watanabe, Teruko, 4,230,584, Cl. 210-516.000.
Tesdahl, Thomas C.: *See*—
Miller, Jack; and Tesdahl, Thomas C., 4,230,592, Cl. 252-156.000.
Testa, Raymond T.: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,230,799, Cl. 435-76.000.
Texaco Inc.: *See*—
Boussid, Issam S., 4,230,182, Cl. 166-273.000.
Brown, George R.; Carroll, Joseph C.; and Dubuisson, S. Elliott, 4,230,422, Cl. 405-210.000.
Kalfoglou, George, 4,230,183, Cl. 166-274.000.
Pitts, Robert W., Jr., 4,231,070, Cl. 358-285.000.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,230,215, Cl. 196-46.000.
Walker, Clarence O., 4,230,587, Cl. 252-8.55R.
Texas Instruments Incorporated: *See*—
Bays, Marvin G., 4,230,201, Cl. 181-115.000.
Cardin, Wilfred W., 4,231,010, Cl. 337-94.000.
Kuo, Chang-Kiang, 4,230,504, Cl. 148-1.500.
Textoris, Melvin A.; and Holman, Thomas L., to GF Business Equipment, Inc. Strut support assembly. 4,229,917, Cl. 52-239.000.
Textron, Inc.: *See*—
Clark, Robert L., 4,230,506, Cl. 148-3.000.
Tezuka, Akitomi. Package for laver-wrapped rice-ball or "Onigiri". 4,230,728, Cl. 426-115.000.
Tgavalekos, Terry: *See*—
Hardy, Michael F.; and Tgavalekos, Terry, 4,230,825, Cl. 525-62.000.
Thaler, Richard, to Sprecher & Schuh AG. Gas-blast switch. 4,230,920, Cl. 200-148.00A.
Theiler, Werner C., Sr., to Minnesota Mining and Manufacturing Company. Hand crimp tool. 4,229,849, Cl. 7-107.000.
Thermacore, Inc.: *See*—
Eastman, George Y.; and Ernst, Donald M., 4,230,173, Cl. 165-1.000.
Thierry, Jean-Pierre; Debionne, Alain; and Nourry, Daniel, to La Telemecanique Electrique. Connection housing for aligned bus bars. 4,230,388, Cl. 339-74.00R.
Thiollier, Gabriel: *See*—
Aldea, Jacques; Eltgen, Jean-Jacques; and Thiollier, Gabriel, 4,230,069, Cl. 118-653.000.
Thomas, Daniel C., to Richardson Company, The. Aryl sulfonic acid based stabilizers for presensitized planographic plates. 4,230,492, Cl. 430-159.000.
Thomas, John P.: *See*—
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,230,190, Cl. 175-5.000.
Thompson, Malcolm J.: *See*—
Fisher, William F.; Thompson, Malcolm J.; Wright, Fred C.; and Robbins, William E., 4,230,726, Cl. 424-325.000.
Thomson-CSF: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,230,596, Cl. 252-299.000.
Pearsall, Thomas, 4,231,049, Cl. 357-13.000.
Thorburn, Maxwell. Locking mechanism. 4,229,956, Cl. 70-129.000.
Thormack Engineering Ltd.: *See*—
Boyne, Ralph A.; and Cottingham, Richard L., 4,230,447, Cl. 431-158.000.
Thorpe, Donald H.: *See*—
Cooke, Victor F. G.; and Thorpe, Donald H., 4,230,813, Cl. 526-329.000.
Tidwell, Hubert. Self-guided reversible two speed row crop irrigator. 4,230,275, Cl. 239-184.000.
TII Corporation: *See*—
Buchwald, Hubert W.; and Houle, Peter C., 4,230,467, Cl. 55-178.000.
Simokat, Frank L., 4,230,910, Cl. 370-71.000.
Tilby, Sydney E., to Intercane Systems, Inc. Methods and apparatus for extracting juice from plant material. 4,230,733, Cl. 426-429.000.
Time and Space Processing, Inc.: *See*—
Davis, Charles R., 4,230,906, Cl. 179-1.0SA.
Timm, John E., to United States of America, Navy. Fast Fourier transform spectral analysis system employing adaptive window. 4,231,103, Cl. 364-726.000.
Tinder, David V.; and Mack, Walter E., to McCord Corporation. Headlamp cleaning assembly. 4,230,276, Cl. 239-229.000.
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., to Warner-Lambert Company. Oxo-pyrido[1,2-a]thienopyrimidine compounds and methods for their production. 4,230,707, Cl. 424-251.000.
Tippmer, Kurt: *See*—
Weber, Heinrich; and Tippmer, Kurt, 4,230,594, Cl. 252-188.000.
Toder, Ellis I. Dual wheel carrier for use in conjunction with curtain track. 4,229,857, Cl. 16-95.00R.
Tokumaru, Tatsuo: *See*—
Morimoto, Koichi; and Tokumaru, Tatsuo, 4,231,075, Cl. 361-433.000.
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,230,401, Cl. 354-25.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukuda, Takeo; and Kawabata, Kazuaki, 4,230,903, Cl. 370-24.000.
Iizuka, Tetsuya, 4,231,055, Cl. 357-42.000.
Minami, Masana; and Watanabe, Tomohide, 4,230,940, Cl. 250-201.000.
Nakamura, Kiyoshi; Komatsu, Michiyasu; and Nakanishi, Masae, 4,230,494, Cl. 106-14.050.
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,231,097, Cl. 364-577.000.
Uehara, Haruo; and Miyoshi, Michizo, 4,230,179, Cl. 165-113.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Munetsugu, Eiichi, 4,231,024, Cl. 340-365.00S.
Suzuki, Yasoji; and Kouyama, Susumu, 4,230,951, Cl. 307-200.00B.
Tol, Dirk, to ITT Industries, Inc. Arrangement to obtain equal travel of hydraulic cylinders. 4,230,304, Cl. 254-89.00H.

Tollet de Santerre, Henri: *See—*
Bonmati, Reynald; Roz, Bernard; and Tollet de Santerre, Henri, 4,230,464, Cl. 55-23.000.
Tondreau, Raymond A.: *See—*
Bray, Donald T.; and Tondreau, Raymond A., 4,230,579, Cl. 210-101.000.
Toner, James K., to Eastman Kodak Company. Sonically securing articles in plastic mounts. 4,230,757, Cl. 428-137.000.
Toray Industries, Inc.: *See—*
Hamaguchi, Masayoshi; Watanabe, Hiroshi; and Hasegawa, Itaru, 4,230,283, Cl. 242-18.0PW.
Tork, Leo; Kolb, Gunter; and Hohne, Wolfgang, to Bayer Aktiengesellschaft. Pigment preparations. 4,230,812, Cl. 526-320.000.
Townsend Engineering Company: *See—*
Townsend, Ray T.; and Vandewege, Orville, 4,230,290, Cl. 244-1.00R.
Townsend, Ray T.; and Vandewege, Orville, to Townsend Engineering Company. Airplane angle of attack and direction of flight indicator. 4,230,290, Cl. 244-1.00R.
Toya, Mitsuo: *See—*
Sekiguchi, Nobuo; Fujiwara, Yukinari; Toya, Mitsuo; and Kaneko, Yoichi, 4,231,116, Cl. 455-87.000.
Toyama, Akira, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Record/playback device for magnetic recording. 4,231,072, Cl. 360-88.000.
Toyama Chemical Co., Ltd.: *See—*
Kodama, Tsutomu; Nakabayashi, Masao; Watanabe, Isao; Hirano, Hiroshi; Abe, Norio; Tanaka, Katsufumi; and Arai, Hirotoshi, 4,230,719, Cl. 424-275.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Hamada, Hiroyuki; Ichikawa, Rinjiro; and Suzuki, Hajime, 4,230,768, Cl. 428-352.000.
Isaka, Tsutomu; Matsuo, Maki; and Miyazaki, Yukinobu, 4,230,767, Cl. 428-349.000.
Toyo Kogyo Co., Ltd.: *See—*
Mashimo, Toru, 4,230,189, Cl. 173-4.000.
Toyoda, Kazuhiro: *See—*
Ono, Chikai; and Toyoda, Kazuhiro, 4,231,109, Cl. 365-174.000.
Suzuki, Masao; Hayashi, Toshio; Kawarada, Kuniyasu; Toyoda, Kazuhiro; and Ono, Chikai, 4,231,108, Cl. 365-174.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kohama, Tokio; Ozaki, Tadashi; Obayashi, Hideki; and Nohira, Hidetaka, 4,230,079, Cl. 23-568.000.
Nohira, Hidetaka; Ito, Sumio; Oki, Hisashi; and Kumai, Teruo, 4,230,073, Cl. 123-308.000.
Tozawa, Katsutoshi: *See—*
Watanabe, Shotaro; Tozawa, Katsutoshi; and Uetake, Shigeru, 4,230,787, Cl. 430-107.000.
Traini, Carlo; Bianchi, Giuseppe; and Pellegri, Alberto, to Oronzio de Nora Impianti Elettrochimici S.p.A. Electrolytic process for treating ilmenite leach solution. 4,230,542, Cl. 204-93.000.
Transaction Technology, Inc.: *See—*
Cassily, Richard J., 4,230,265, Cl. 235-455.000.
Traub, Norman L.: *See—*
Schroeder, Thaddeus; and Traub, Norman L., 4,230,918, Cl. 200-61.620.
Treat, Charles D.: *See—*
Douglas, Walter H.; Peterson, Richard F.; Nielsen, Willard J.; Treat, Charles D.; Hagaman, Jerry B.; Loveless, Wendell G.; and Scott, William R., 4,229,991, Cl. 74-409.000.
Tremblay, Gerard B.: *See—*
Moreau, Jean R.; Pelletier, Martin P.; and Tremblay, Gerard B., 4,230,459, Cl. 44-10.00B.
Tripodi, Mary K.: *See—*
Henis, Jay M. S.; and Tripodi, Mary K., 4,230,463, Cl. 55-16.000.
Trofimuk, Andrei A.: *See—*
Svirschevsky, Valentin K.; Trofimuk, Andrei A.; Vasiliev, Gennady G.; and Leonov, Ivan P., 4,230,191, Cl. 175-20.000.
Trottier, Danielle: *See—*
Vedrine, Alain; Gacon, Jean-Claude; Boulon, Georges; and Trottier, Danielle, 4,230,598, Cl. 252-301.40H.
Troxel, Ronald L. Pliers type cutting tool and the like. 4,229,881, Cl. 30-254.000.
TRW Inc.: *See—*
Seto, Rodney K. M.; Brickman, Eugene L.; and Fitzgibbons, Michael R., 4,230,187, Cl. 166-362.000.
Tsimbler, Jury A.: *See—*
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Matveev, Vladimir M.; Minin, Oleg D.; Tsimbler, Jury A.; Vasiliev, Vladimir A.; and Provalsky, Gennady B., 4,229,946, Cl. 62-341.000.
Tsubai, Yasuo; Yoshida, Akio; and Suzuki, Shigeyoshi, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate from silver halide emulsion. 4,230,792, Cl. 430-302.000.
Tsuchie, Kimihiro; and Harada, Takafumi, to Shimano Industrial Company, Limited. Rear hub for a bicycle. 4,230,212, Cl. 192-64.000.
Tsuchiya, Fujio; Yamamoto, Kenzo; Yamaguchi, Katsunobu; and Okagami, Akio, to JGC Corporation; and Orient Kagaku Kogyo K.K. Method of obtaining dried terephthalic acid. 4,230,886, Cl. 562-486.000.
Tsuda, Hiroshi: *See—*
Nishikawa, Masaji; Nakatsubo, Toshio; Tsuda, Hiroshi; Fujie, Shigo; Kanamaru, Masazi; and Koseki, Shosaku, 4,230,786, Cl. 430-53.000.
Tsuji, Sadahiko; and Sato, Yasuhisa, to Canon Kabushiki Kaisha. Zoom lens system. 4,230,398, Cl. 350-184.000.
Tsuji, Sigeki; Shiozaki, Hiromichi; and Yamasaki, Eiji, to Sharp Kabushiki Kaisha. Automatic record player. 4,230,323, Cl. 274-9.0RA.
Tsujii, Yasuhiro: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Tsujii, Yasuhiro; and Shigehara, Itaru, 4,230,642, Cl. 570-193.000.
Tsukamoto, Kunio: *See—*
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Watanabe, Tadaharu; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,230,703, Cl. 424-244.000.
Tuleja, Anthony Z. Drain traps with strainer means. 4,230,582, Cl. 210-311.000.
Tulis, Milton A.; Lawson, Charles M.; and Whiting, Lawrence D., III, to United States of America, Army. Pyrophoric flame composition. 4,230,509, Cl. 149-109.400.
Tunderman, William. Method for reconditioning rivetless chain links. 4,229,962, Cl. 72-342.000.
Turkdogan, Ethem T.: *See—*
Olsson, Robert G.; and Turkdogan, Ethem T., 4,230,603, Cl. 252-463.000.
Turley, Patricia A.: *See—*
Capuano, Italo A.; and Turley, Patricia A., 4,230,486, Cl. 75-81.000.
Turner, Dennis R., to Bell Telephone Laboratories, Incorporated. Strip line plating cell. 4,230,538, Cl. 204-15.000.
Turner, John H., Jr., to Metritape, Inc. Level and temperature readout and alarm system. 4,231,025, Cl. 340-521.000.
Turner, Robert C.: *See—*
Holman, Rury R.; and Turner, Robert C., 4,230,118, Cl. 128-314.000.
Turner, William N.: *See—*
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,230,847, Cl. 536-10.000.
Turrin, Richard H., to Bell Telephone Laboratories, Incorporated. Hybrid mode waveguide and feedhorn antennas. 4,231,042, Cl. 343-786.000.
Tyler, Hugh J., to Robertshaw Controls Company. Microwave cooking method and control means. 4,230,731, Cl. 426-233.000.
U-Brand Corporation: *See—*
Miller, Don R., 4,230,301, Cl. 251-367.000.
Uchanski, Joseph. Traction device. 4,230,269, Cl. 238-14.000.
Uchida, Tomoaki, to Victor Company of Japan Ltd. Vertical synchronization circuit for a cathode-ray tube. 4,231,064, Cl. 358-158.000.
Uchiyama, Takashi; Nakamura, Zenzo; and Ohtaki, Shohei, to Canon Kabushiki Kaisha. Flash exposure control system. 4,230,402, Cl. 354-33.000.
Uebayashi, Takeo: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.
Ueda, Masakazu: *See—*
Asari, Akira; Ueda, Masakazu; and Nishimoto, Takeo, 4,230,661, Cl. 264-323.000.
Ueda, Nobuo, to Laurel Bank Machine Co., Ltd. Sorted coin counting apparatus. 4,230,135, Cl. 133-3.00D.
Ueda, Shigeki, to Matsushita Electric Industrial Co., Ltd. Input signal recognition circuit. 4,231,016, Cl. 340-166.00R.
Uedono, Shigezo: *See—*
Nojiri, Michihiko; Kakutani, Kazuo; Uedono, Shigezo; Uenakai, Kazuo; and Matsumoto, Masafumi, 4,230,806, Cl. 435-255.000.
Uehara, Haruo; and Miyoshi, Michizo, to Uehara, Haruo; and Tokyo Shibaura Denki Kabushiki Kaisha. Plate type condensers. 4,230,179, Cl. 165-113.000.
Uematsu, Kazuma. Rhythmical traction type device for medical treatment. 4,230,098, Cl. 128-33.000.
Uenakai, Kazuo: *See—*
Nojiri, Michihiko; Kakutani, Kazuo; Uedono, Shigezo; Uenakai, Kazuo; and Matsumoto, Masafumi, 4,230,806, Cl. 435-255.000.
Uetake, Shigeru: *See—*
Watanabe, Shotaro; Tozawa, Katsutoshi; and Uetake, Shigeru, 4,230,787, Cl. 430-107.000.
UMC Industries, Inc.: *See—*
Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., 4,231,105, Cl. 364-900.000.
Under Sea Industries, Inc.: *See—*
Hart, Dennis L., 4,230,140, Cl. 137-81.200.
Uni-Mist, Inc.: *See—*
Boelkins, Wallace G., 4,230,345, Cl. 285-7.000.
Union Carbide Corporation: *See—*
Kagetsu, Tadashi J.; De Atley, William B.; Fox, Joseph S.; and Malacarne, Oreste J., 4,230,677, Cl. 423-54.000.
Union, Donald C., to General Atomic Company. Multiple-processor digital communication system. 4,231,015, Cl. 340-147.00R.
Unisearch Limited: *See—*
Szulmayer, Wally, 4,230,094, Cl. 126-439.000.
United Kingdom Atomic Energy Authority: *See—*
Antill, John E., 4,230,489, Cl. 75-174.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Day, Derek J.; and Elliot, Charles T., 4,231,052, Cl. 357-24.000.
Hunt, Geoffrey H., 4,231,068, Cl. 358-252.000.
United States of America
Agriculture: *See—*
Fisher, William F.; Thompson, Malcolm J.; Wright, Fred C.; and Robbins, William E., 4,230,726, Cl. 424-325.000.
Army: *See—*

Figge, Irving E.; and Dean, Edward H., 4,230,764, Cl. 428-268.000.
Tulis, Milton A.; Lawson, Charles M.; and Whiting, Lawrence D., III, 4,230,509, Cl. 149-109.400.
Energy: *See—*
Bamberger, Carlos E., 4,230,682, Cl. 423-579.000.
Bradley, Laird P., 4,230,994, Cl. 331-94.5PE.
Briggs, Richard L.; and Meacham, Sterling A., 4,230,526, Cl. 176-38.000.
Dial, Charles E., Sr., 4,229,909, Cl. 51-165.750.
Spurrier, Francis R., 4,230,959, Cl. 310-11.000.
Taylor, Robert S.; and Boyer, Norman W., 4,230,660, Cl. 264-311.000.
Vollhardt, Kurt P. C.; and Perkins, Patrick, 4,230,633, Cl. 260-449.60M.
Winston, Roland, 4,230,095, Cl. 126-439.000.
Yarbro, Orlan O., 4,230,675, Cl. 422-272.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brown, Patricia A.; and Vernikos, Joan. Indomethacin-antihistamine combination for gastric ulceration control. 4,230,717, Cl. 424-274.000.
Navy: *See—*
Burnham, Ralph L., 4,230,995, Cl. 331-94.50G.
Dickson, Charles H., Sr., 4,229,832, Cl. 2-2.10R.
Gleason, K. Reed, 4,231,058, Cl. 357-67.000.
Kalaf, George P.; and Henschen, Irvin C., 4,230,059, Cl. 114-20.00R.
Peabody, Roger H., 4,231,036, Cl. 343-5.0EM.
Schoolar, Richard B., 4,231,053, Cl. 357-30.000.
Schwee, Leonard J.; Irons, Henry R.; and Anderson, Wallace E., 4,231,107, Cl. 365-87.000.
Timm, John E., 4,231,103, Cl. 364-726.000.
U.S. Philips Corporation: *See—*
Compen, Johannes M. A. A., 4,230,966, Cl. 313-481.000.
Crowther, Gerald O.; Douglas, Terence A.; and Farmer, Howard M., 4,231,031, Cl. 340-695.000.
de Bont, Marinus R. J.; Kivits, Petrus J.; Schoot, Cornelis J.; and Zalm, Pieter, 4,230,939, Cl. 235-488.000.
Dil, Jan G.; and Jacobs, Bernardus A. J., 4,230,915, Cl. 179-100.10G.
Eggermont, Ludwig D. J., 4,231,100, Cl. 364-724.000.
Eggermont, Ludwig D. J., 4,231,101, Cl. 364-724.000.
Holford, Kenneth, 4,231,038, Cl. 343-5.0DD.
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,230,788, Cl. 430-153.000.
van Doorn, Cornelis Z.; and DeKlerk, Jacobus J. M. J., 4,231,035, Cl. 340-784.000.
United States Steel Corporation: *See—*
Olsson, Robert G.; and Turkdogan, Ethem T., 4,230,603, Cl. 252-463.000.
Rueckl, Roger L., 4,230,498, Cl. 106-58.000.
Weil, Richard C., 4,230,835, Cl. 525-316.000.
United Technologies Corporation: *See—*
Cook, Curtis H., Jr., 4,230,996, Cl. 331-94.50D.
Marshall II, John, deceased, 4,230,291, Cl. 244-17.110.
Unitika Limited: *See—*
Kuga, Mutsuo; Kitagawa, Kiyoshi; Kawasaki, Motoo; and Watanabe, Junkichi, 4,230,654, Cl. 264-134.000.
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Hayashi, Tadashi; and Kozuma, Akiyoshi, 4,230,658, Cl. 264-235.800.
University of Illinois Foundation, The: *See—*
Gaul, John H., Jr.; and Drago, Russell S., 4,230,828, Cl. 525-153.000.
University of Iowa Research Foundation, The: *See—*
Youm, Youngil; and Flatt, Adrian E., 4,229,841, Cl. 3-1.910.
University of Pittsburgh: *See—*
DelVecchio, Robert M.; and Meiksin, Zvi H., 4,231,011, Cl. 338-2.000.
University of Utah: *See—*
Wells, Gregory J.; and Voorhees, Kent J., 4,230,946, Cl. 250-425.000.
UOP Inc.: *See—*
Cheshire, Ernest L., 4,230,414, Cl. 403-95.000.
Howard, Leroy J., 4,230,535, Cl. 203-26.000.
Uozumi, Fumiko: *See—*
Matsumoto, Tetsuo, 4,230,264, Cl. 233-27.000.
Uozumi, Masana: *See—*
Okada, Shuhei; Uozumi, Masana; Matsuura, Masanori; and Sadaike, Masazumi, 4,230,225, Cl. 206-387.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,230,629, Cl. 260-404.000.
Ura, Yasuyuki: *See—*
Kaneda, Hiroshi; Watabe, Yoji; Souma, Akio; Ura, Yasuyuki; Ishii, Michio; and Anzai, Shiro, 4,230,168, Cl. 152-310.000.
Urakami, Akio, to Ryobi, Ltd. Fishing rod and reel mounting handle. 4,229,898, Cl. 43-21.200.
Urashima, Chikao: *See—*
Tanaka, Junzo; and Urashima, Chikao, 4,231,007, Cl. 335-131.000.
Urata, Tetsuro: *See—*
Sato, Kunihiko; Urata, Tetsuro; Asamoto, Tetsuhiro; Asakawa, Kobun; Uebayashi, Takeo; and Taguchi, Haruo, 4,230,927, Cl. 219-69.00C.
Usardi, Maria M.: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,230,721, Cl. 424-285.000.
Ushijima, Shigemi, to Chugairo Kogyo Kaisha Ltd. Method of operating a reheating furnace in a hot rolling line and a reheating furnace employed therefor. 4,229,878, Cl. 29-527.700.
Uskokovic, Milan R.: *See—*
Despreaux, Carl; Narwid, Thomas A.; Palleroni, Norberto J.; and Uskokovic, Milan R., 4,230,625, Cl. 260-397.100.
Holick, Michael F.; and Uskokovic, Milan R., 4,230,701, Cl. 424-236.000.
USM Corporation: *See—*
Rawson, Francis F. H., 4,229,888, Cl. 36-1.000.
Usmani, Arthur M.: *See—*
Salyer, Ival O.; and Usmani, Arthur M., 4,230,551, Cl. 204-181.00R.
Uyeda, Stanley T.: *See—*
Springett, Charles N.; Abramovich, Dan; Uyeda, Stanley T.; and Radu, E. John, 4,230,421, Cl. 356-198.000.
Uys Naude, Thomas F., to Optic Ads (Pty.) Limited. Fluid dispensing apparatus and display means. 4,229,893, Cl. 40-332.000.
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, to Sintokogio Ltd. Molding apparatus with a compressed air squeeze plate. 4,230,172, Cl. 164-192.000.
Vaillagou, Pierre: *See—*
Lindebrings, Charles M. P.; Vaillagou, Pierre; and Velte, Andre J. F., 4,229,879, Cl. 29-840.000.
Vajtay, Leslie. Thermoplastic container. 4,229,929, Cl. 53-456.000.
Valfivre S.p.A.: *See—*
Cirri, Gianfranco, 4,230,993, Cl. 331-94.50M.
Valli, Giuseppe: *See—*
Braconi, Gustavo; and Valli, Giuseppe, 4,230,251, Cl. 228-41.000.
Valyi, Emery I. Apparatus for the preparation of hollow plastic articles. 4,230,298, Cl. 249-65.000.
van Beek, Leendert K. H.: *See—*
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,230,788, Cl. 430-153.000.
Van Bennekom, Carl F.: *See—*
Schultz, William J.; and Van Bennekom, Carl F., 4,229,874, Cl. 29-432.000.
Van Berkel, Johannes: *See—*
Verbrugge, Pieter A.; Kramer, Petrus A.; Van Berkel, Johannes; and Kelderman, Hendrik C., 4,230,891, Cl. 568-591.000.
Van Bracht, Raymond: *See—*
Nieuwenhuis, Mogens D.; and Van Bracht, Raymond, 4,230,969, Cl. 315-241.00S.
Vanden Eynde, Hector A.; and Van Poucke, Raphael K., to AGFA-GEVAERT N.V. Novel photographic color couplers. 4,230,870, Cl. 548-360.000.
Vandewege, Orville: *See—*
Townsend, Ray T.; and Vandewege, Orville, 4,230,290, Cl. 244-1.00R.
van Doorn, Cornelis Z.; and DeKlerk, Jacobus J. M. J., to U.S. Philips Corporation. Liquid crystal display for large time multiplexing factors. 4,231,035, Cl. 340-784.000.
Van Dyke, Ronald D.: *See—*
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D., 4,230,430, Cl. 410-59.000.
Stoller, Patricia S.; Hammonds, James C.; and Van Dyke, Ronald D., 4,230,431, Cl. 410-59.000.
Van Nguyen, Bach: *See—*
Gaussens, Gilbert; Lemaire, Francis; and Van Nguyen, Bach, 4,230,766, Cl. 428-288.000.
Van Nimwegen, Robert R., to Garrett Corporation, The. Propulsion/-control for VTOL vehicle. 4,230,292, Cl. 244-23.00D.
VanOrnum, James H.: *See—*
Hunsberger, Dennis J.; Nahabedian, Charles E.; Quinn, Thomas M.; and VanOrnum, James H., 4,231,087, Cl. 364-200.000.
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Vollhardt, Kurt P. C.; and Perkins, Patrick, to United States of America, Energy. Novel Fischer-Tropsch catalysts. 4,230,633, Cl. 260-449.60M.
von Benda, Klaus; and Kistrup, Holger, to Deutsche Automobilgesellschaft mbH. Sodium-sulfur battery with glass electrolyte. 4,230,778, Cl. 429-104.000.
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Vydrin, Vladimir N.; Pastukhov, Valery V.; Barkov, Leonid A.; and Sysoev, Vladimir S. Continuous mill. 4,229,961, Cl. 72-235.000.
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Wain, John K. Joining yarns. 4,229,935, Cl. 57-22.000.
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Walker, Scott H., to Motorola, Inc. Simultaneous multiple beam antenna array matrix and method thereof. 4,231,040, Cl. 343-100.0SA.
Walsh, David A.; and Weistead, William J., Jr., to A. H. Robins Company, Inc. 1-Substituted-3,4-epoxypyrrolidines. 4,230,718, Cl. 424-274.000.
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Wasservogel, Francois. Trailer for coupling to road vehicles. 4,230,340, Cl. 280-656.000.
Watabe, Seiji: *See—*
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Watanabe, Tadaharu: *See—*
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Waters, Erwin, to S & F Sheet Metal and Welding Works Inc. Water conserving showering system. 4,229,948, Cl. 62-376.000.
Watson, Trevor F., to Kli, Inc. Tubal ligation instrument with anesthesia means. 4,230,116, Cl. 128-303.00A.
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Watts, William A., to Goodyear Tire & Rubber Company, The. Composite of a high nitrile copolymer adhered to an olefin based polymer. 4,230,761, Cl. 428-215.000.
Watts, William A.; and Creekmore, Mark D., to Goodyear Tire & Rubber Company, The. Heat sealable laminate. 4,230,774, Cl. 428-518.000.
Wavin B.V.: *See—*
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Wearing, Brian J.; and Zaidi, Syed M. A., to B.S.R. Limited of Monarch Works. Electric switch. 4,230,921, Cl. 200-153.00J.
Weaver, Harry R.: *See—*
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Weeks, Lloyd E.: *See—*
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Wei, Chung H., to Stauffer Chemical Company. Process for preparing resistant vinyl halide polymers. 4,230,832, Cl. 525-260.000.
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Weidenbach, Guenter; and Bonse, Dirk, to Kali-Chemie Aktiengesellschaft. Preparation of water-insoluble enzyme compositions. 4,230,803, Cl. 435-176.000.
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Weiler, Ernest D., to Rohm and Haas Company. Isothiazolidin-3-ones. 4,230,704, Cl. 424-248.510.
Weiler, Wolfgang, to Motoren- und Turbinen-Union Munchen GmbH. Fuel injection nozzle assembly for gas turbine drive. 4,229,944, Cl. 60-740.000.
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Wellendorf, Klaus; and Sommer, Ruediger, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for producing image combinations. 4,231,069, Cl. 358-256.000.
Wellings, Frederick L. Electro-acoustic transducer. 4,230,013, Cl. 84-1.140.
Wells, Gregory J.; and Voorhees, Kent J., to University of Utah. Cryogenic collimator apparatus and method. 4,230,946, Cl. 250-425.0A0.
Wells, Royzell F., to Martin Marietta Corporation. Double action, electrical connector coupling device. 4,230,390, Cl. 339-90.00R.
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Wengler, Christian; and Vogt, Herbert, to Siemens Aktiengesellschaft. Housing for semiconductor device. 4,230,901, Cl. 174-52.0PE.
Wenzel, Kenneth H. Bumping and jarring tool. 4,230,197, Cl. 175-297.000.
Wenzlick, Erich; and Rothfuss, Hermann, to BBP Kunststoffwerk Marbach Baier & Co. Plastics drawer for furniture. 4,230,382, Cl. 312-330.00R.
Weresch, Thomas. Apparatus for treating leads of electrical components. 4,229,964, Cl. 72-452.000.
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Patton, Franklin D.; and McFarlane, James D., 4,230,180, Cl. 166-185.000.
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Westinghouse Electric Corp.: *See—*
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Darwent, Richard H., 4,230,205, Cl. 187-22.000.
Hower, Philip L.; and Page, Derrick J., 4,231,059, Cl. 357-68.000.
Johnston, Paul M., 4,231,029, Cl. 340-658.000.
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White, Robert W. Building panel. 4,229,916, Cl. 52-98.000.
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Wiens, Klaus, to Paper Converting Machine Company. Apparatus for intermediately storing products on storage devices. 4,230,216, Cl. 198-347.000.
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William H. Rorer, Inc.: *See—*
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Williams, Danny L.: *See—*
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Williams, Irving. Replaceable cartridge type oxygen generator and oxygen supply system including a plurality of such generators. 4,230,667, Cl. 422-113.000.

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Wilson, Thomas S. Spare tire carrier. 4,230,246, Cl. 224-42.210.
Wilson, Warren. Funnel pitcher enabling batter to be prepared and poured into a cooking utensil. 4,230,238, Cl. 222-158.000.
Wiltse, Harold L., to Wiltse, Mary Louise. Flow metering and shut-off valve. 4,230,300, Cl. 251-205.000.
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Wolff Manufacturing Company: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barlow Marine Limited: *See*—
Hutton, Albert J.; Hutton, Allen W.; and Dellit, Richard J., Re. 30,423, Cl. 254-346.000.

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Broyhill Furniture Industries, Inc.: *See*—
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Brunswick Corporation: *See*—
Moore, William D., 257,469, Cl. D21-232.000.

Campbell, Arlin L.; and Cannon, Roger B., to Ball Corporation. Beverage container. 257,463, 10-28-80, Cl. D9-216.000.

Cannon, Roger B.: *See*—
Campbell, Arlin L.; and Cannon, Roger B., 257,463, Cl. D9-216.000.

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King, Danny L. Combination tool for glazing. 257,461, 10-28-80, Cl. D8-55.000.

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Culler, Randy R., 257,451, Cl. D6-36.000.
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Laub, Henry A., Jr.; and Laub, Steven D. Device to reform threads. 257,460, 10-28-80, Cl. D8-51.000.

Laub, Steven D.: *See*—
Laub, Henry A., Jr.; and Laub, Steven D., 257,460, Cl. D8-51.000.

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Moore, William D., to Brunswick Corporation. Billiard table. 257,469, 10-28-80, Cl. D21-232.000.

Nash, Stanley P., to Schweiger Industries, Inc. Seat or similar article. 257,453, 10-28-80, Cl. D6-63.000.

Nash, Stanley P., to Schweiger Industries, Inc. Seat or similar article. 257,454, 10-28-80, Cl. D6-63.000.

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Persiani, John D. Bin for granular material. 257,464, 10-28-80, Cl. D9-222.000.

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CLASSIFICATION OF PATENTS

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187.5 R 4,230,086
193 CH 4,230,087
203 4,230,088
308 4,230,073
389 4,230,077
416 4,230,078
450 4,230,083
518 4,230,082
555 4,230,081
568 4,230,080

CLASS 126

30 4,230,089
72 4,230,090
77 4,230,091
126 4,230,092
190 4,230,093
439 4,230,094
4,230,095

CLASS 127

1 4,230,503

CLASS 128

1 A 4,230,097
1 R 4,230,096
33 4,230,098
69 4,230,099
70 4,230,100
78 4,230,101
79 4,230,102
80 A 4,230,103
89 A 4,230,104
156 4,230,105
201.11 4,230,106
205.26 4,230,107
207.15 4,230,108
214 R 4,230,109
214.4 4,230,110
225 4,230,111
272.3 4,230,112
287 4,230,113
293 4,230,114
295 4,230,115
303 A 4,230,116
303 B 4,230,117
314 4,230,118
325 4,230,119
419 PT 4,230,120
422 4,230,121
635 4,230,122
658 4,230,123
660 4,230,124
670 4,230,125
671 4,230,126
706 4,230,127
763 4,230,128
804 4,230,129

CLASS 130

27 R 4,230,130

CLASS 131

4 A 4,230,131
70 4,230,132

CLASS 132

40 4,230,133
45 R 4,230,134

CLASS 133

3 D 4,230,135
3 E 4,230,136

CLASS 137

8 4,230,137
13 4,230,138
74 4,230,139
81.2 4,230,140
103 4,230,141
202 4,230,142
270 4,230,143
343 4,230,144
410 4,230,145
494 4,230,146
504 4,230,147
512.1 4,230,148
517 4,230,149
527 4,230,150
595 4,230,151
596 4,230,152
599 4,230,153
614.17 4,230,154
624.22 4,230,155
625.5 4,230,156

CLASS 138

155 4,230,157

CLASS 139

1 C 4,230,158
91 4,230,159

CLASS 141

116 4,230,160
302 4,230,161

CLASS 144

3 R 4,230,162
116 4,230,163
134 D 4,230,164
209 R 4,230,165

CLASS 148

1.5 4,230,504
4,230,505
3 4,230,506
6.11 4,230,507
186 4,230,508

CLASS 149

109.4 4,230,509

CLASS 151

7 4,230,166

CLASS 152

209 R 4,230,512
233 4,230,167
310 4,230,168
353 R 4,230,169

CLASS 156

67 4,230,510
123 R 4,230,511
299 4,230,513
305 4,230,514
315 4,230,613
345 4,230,515
364 4,230,516
396 4,230,517
456 4,230,518
468 4,230,519
505 4,230,520
549 4,230,521
638 4,230,522
657 4,230,523

CLASS 157

1.24 4,230,170

CLASS 160

84 R 4,230,171

CLASS 162

25 4,230,524
164 R 4,230,525

CLASS 164

192 4,230,172

CLASS 165

1 4,230,173
27 4,230,174
46 4,230,175
67 4,230,176
4,230,177
76 4,230,178
113 4,230,179

CLASS 166

185 4,230,180
259 4,230,181
273 4,230,182
274 4,230,183
312 4,230,184
332 4,230,185
342 4,230,186
362 4,230,187

CLASS 171

101 4,230,188

CLASS 173

4 4,230,189

CLASS 174

32 4,230,898
47 4,230,899
48 4,230,900
52 PE 4,230,901

CLASS 175

5 4,230,190
20 4,230,191
59 4,230,192
297 4,230,197
379 4,230,193
4,230,194

CLASS 176

38 4,230,526
87 4,230,527

CLASS 177

1 4,230,195
141 4,230,196

CLASS 178

15 4,230,902

CLASS 179

1 CN 4,230,908
1 E 4,230,907
1 GA 4,230,905
1 HF 4,230,904
1 SA 4,230,906
6 R 4,230,909
16 EA 4,230,912
18 FC 4,230,913
81 E 4,230,914
100.1 G 4,230,915

CLASS 180

7 P 4,230,198
9.2 R 4,230,199
272 4,230,200

CLASS 181

115 4,230,201

CLASS 182

45 4,230,202
134 4,230,203

CLASS 186

66 4,230,204

CLASS 187

22 4,230,205
29 R 4,230,206

CLASS 188

73.1 4,230,207
4,230,208

CLASS 191

40 4,230,209

CLASS 192

28 4,230,210
35 4,230,211
64 4,230,212

CLASS 194

1 K 4,230,213
59 4,230,214

CLASS 196

46 4,230,215

CLASS 198

347 4,230,216
397 4,230,217
461 4,230,218
481 4,230,219
509 4,230,220
513 4,230,221
580 4,230,222
817 4,230,223

CLASS 200

6 A 4,230,916
42 T 4,230,917
61.62 4,230,918
67 B 4,230,919
148 A 4,230,920
153 J 4,230,921
302 4,230,922

CLASS 201

12 4,230,528

CLASS 202

175 4,230,529
180 4,230,530
4,230,531
248 4,230,532

CLASS 203

1 4,230,533
4,230,534
26 4,230,535
89 4,230,536

CLASS 204

1 T 4,230,537
15 4,230,538
35 N 4,230,539
67 4,230,540
73 A 4,230,541
93 4,230,542
98 4,230,543
4,230,544
114 4,230,545
157.1 R 4,230,546
4,230,547
159.14 4,230,548
159.17 4,230,549
159.23 4,230,550
181 C 4,230,552
181 R 4,230,551
192 E 4,230,553
195 S 4,230,555
195 T 4,230,554

CLASS 206

87 4,230,224
387 4,230,225
570 4,230,226
600 4,230,227

CLASS 208

8 LE 4,230,556
8 R 4,230,557

CLASS 209

3.1 4,230,558
139 R 4,230,559
212 4,230,560
464 4,230,561

CLASS 210

85 4,230,577
86 4,230,578
101 4,230,579
170 4,230,580
261 4,230,581
311 4,230,582
490 4,230,583
516 4,230,584
600 4,230,567
610 4,230,562
629 4,230,563
652 4,230,564
683 4,230,565
693 4,230,566
751 4,230,568
754 4,230,569
758 4,230,570
760 4,230,571
767 4,230,572
4,230,573
778 4,230,574
780 4,230,575
797 4,230,576

CLASS 213

62 A 4,230,228

CLASS 215

253 4,230,229
321 4,230,230
329 4,230,231
330 4,230,232

CLASS 217

36 4,230,233

CLASS 219

10.53 4,230,923
10.55 E 4,230,924
56.1 4,230,925
69 C 4,230,927
69 V 4,230,926
76.11 4,230,928
111 4,230,929
121 LD 4,230,930
265 4,230,931
370 4,230,932
375 4,230,933
421 4,230,934
523 4,230,935

CLASS 220

18 4,230,234
94 R 4,230,235

CLASS 221

190 4,230,236
298 4,230,237

CLASS 222

158 4,230,238
185 4,230,239
212 4,230,240
252 4,230,241
321 4,230,242
402.18 4,230,243
450 4,230,244

CLASS 224

39 4,230,245
42.21 4,230,246
45 R 4,230,247
323 4,230,248

CLASS 227

123 4,230,249

CLASS 228

20 4,230,250
41 4,230,251
152 4,230,252
4,230,253
182 4,230,254
184 4,230,255
193 4,230,256
244 4,230,257

CLASS 229

30 4,230,258
38 4,230,259
39 B 4,230,260
52 B 4,230,261
69 4,230,262

CLASS 233

23 R 4,230,263
27 4,230,264

CLASS 235

70 A 4,230,936
94 R 4,230,937
441 4,230,938
455 4,230,265
488 4,230,939
490 4,230,266

CLASS 236

9 A 4,230,267

CLASS 237

51 4,230,268

CLASS 238

14 4,230,269

CLASS 239

67 4,230,270
113 4,230,271
121 4,230,272
125 4,230,273
132.3 4,230,274
184 4,230,275
229 4,230,276
333 4,230,277
427.5 4,230,278
559 4,230,279
677 4,230,280

CLASS 241

142 4,230,281
159 4,230,282

CLASS 242

18 G 4,230,284
18 PW 4,230,283
43 R 4,230,285
68.6 4,230,286
77.1 4,230,287
107 4,230,288
107.4 A 4,230,289

CLASS 244

1 R 4,230,290
17.11 4,230,291
23 D 4,230,292
119 4,230,293
170 4,230,294
213 4,230,295

CLASS 248

309 R 4,230,296
317 4,230,297

CLASS 249

65 4,230,298

CLASS 250

201 4,230,940
204 4,230,941
4,230,942
281 4,230,943
355 4,230,944
370 4,230,945
425 4,230,946
434 4,230,947
445 T 4,230,948
4,230,949
574 4,230,950

CLASS 251

14 4,230,299
205 4,230,300
367 4,230,301

CLASS 252

8.1 4,230,585
8.5 P 4,230,586
8.55 R 4,230,587
51.5 A 4,230,588
62.9 4,230,589
97 4,230,590
102 4,230,591
156 4,230,592
179 4,230,593
188 4,230,594
4,230,595
299 4,230,596
301.1 W 4,230,597
301.4 H 4,230,598
321 4,230,599
364 4,230,600
408 4,230,601
421 4,230,602
463 4,230,603
518 4,230,604
545 4,230,605

CLASS 254

89 H 4,230,304
134.3 FT 4,230,305
212 4,230,302
4,230,303
346 Re.30,423
371 4,230,306

CLASS 260

6 4,230,606
23 XA 4,230,607
29.15 B 4,230,611
29.4 UA 4,230,608
29.6 M 4,230,610
29.6 TA 4,230,609
33.2 R 4,230,612
33.6 PQ 4,230,614
34.2 4,230,615
40 R 4,230,616
112.5 S 4,230,617
187 4,230,618
239 A 4,230,619
239.1 4,230,620
239.57 4,230,621
245.3 4,230,622
326.5 SM 4,230,623
345.2 4,230,624
397.1 4,230,625
397.2 4,230,626
4,230,627
404 4,230,628
4,230,629
428 4,230,630
429 R 4,230,631
449.6 M 4,230,633
465.3 4,230,634
556 A 4,230,635
561 R 4,230,636
580 4,230,637
960 4,230,644

CLASS 261

19 4,230,645
35 4,230,646
78 R 4,230,647
87 4,230,648

CLASS 264

22 4,230,649
24 4,230,650
29.7 4,230,651
30 4,230,652
39 4,230,653
134 4,230,654
135 4,230,655
171 4,230,656
234 4,230,657
235.8 4,230,658
266 4,230,659
311 4,230,660
323 4,230,661
553 4,230,662

CLASS 266

46 4,230,307
92 4,230,308

CLASS 267

120 4,230,309

CLASS 269

316 4,230,310

CLASS 271

3.1 4,230,311
215 4,230,312

CLASS 272

93 4,230,313

CLASS 273

1 E 4,230,314
54 R 4,230,315
93 R 4,230,316
119 A 4,230,317
119 R 4,230,318
192 4,230,319
243 4,230,320
308 4,230,321
420 4,230,322

CLASS 274

9 RA 4,230,323

CLASS 277

74 4,230,324
117 4,230,325
166 4,230,326

CLASS 279

61 4,230,327
71 4,230,328

CLASS 280

43.17 4,230,329
87.04 A 4,230,330
218 4,230,331
281 B 4,230,332
406 A 4,230,333
415 R 4,230,334
423 A 4,230,335
507 4,230,336
605 4,230,337
618 4,230,338
647 4,230,339
656 4,230,340
702 4,230,341
803 4,230,342
4,230,343

CLASS 283

6 4,230,344

CLASS 285

7 4,230,345
42 4,230,346
119 4,230,347
297 4,230,348
342 4,230,349

CLASS 292

144 4,230,350
223 4,230,351
341.17 4,230,352
343 4,230,353

CLASS 294

1 B 4,230,354
15 4,230,355
19 R 4,230,356
4,230,357

CLASS 296

24 R 4,230,358
101 4,230,359
181 4,230,360
193 4,230,361

CLASS 297

174 4,230,362
184 4,230,363
457 4,230,365
468 4,230,364
487 4,230,366

CLASS 299

2 4,230,367
4,230,368
14 4,230,369
33 4,230,370
4,230,371
39 4,230,372

CLASS 303

7 4,230,373
22 R 4,230,374
105 4,230,375
106 4,230,376
118 4,230,377

CLASS 305

22 4,230,378

CLASS 307

200 B 4,230,951
221 D 4,230,952
230 4,230,953
238 4,230,954
252 J 4,230,955
257 4,230,956
279 4,230,957
353 4,230,958

CLASS 308

187 4,230,379

CLASS 310

11 4,230,959
51 4,230,960
68 R 4,230,961
239 4,230,962
306 4,230,963

CLASS 312

9 4,230,380
295 4,230,381
330 R 4,230,382

CLASS 313

220 4,230,964
407 4,230,965
481 4,230,966

CLASS 315

3 4,230,967
39.51 4,230,968
241 S 4,230,969
307 4,230,970
4,230,971
382 4,230,972
383 4,230,973
399 4,230,974

CLASS 318

6 4,230,975
138 4,230,976
305 4,230,977
687 4,230,978
721 4,230,979

CLASS 323

19 4,230,980
25 4,230,981

CLASS 324

52 4,230,982
71 R 4,230,983
115 4,230,984
158 F 4,230,985
4,230,986
236 4,230,987
439 4,230,988

CLASS 328

140 4,230,991
4,230,992

CLASS 331

94.5 D 4,230,996
94.5 G 4,230,995
94.5 H 4,230,997
94.5 M 4,230,993
94.5 PE 4,230,994
111 4,230,998
115 4,230,999

CLASS 333

33 4,231,003
109 4,231,000
110 4,231,001
165 4,231,002

CLASS 335

36 4,231,006
131 4,231,007
209 4,231,008
212 4,231,009

CLASS 337

94 4,231,010

CLASS 338

2 4,231,011

CLASS 339

17 R 4,230,383
4,230,384
4,230,385
42 4,230,386
59 M 4,230,387
74 R 4,230,388
75 M 4,230,389
90 R 4,230,390
97 R 4,230,391
117 R 4,230,392

CLASS 340

52 A 4,231,012
72 4,231,013
146.3 Y 4,231,014
147 R 4,231,015
166 R 4,231,016
4,231,017
171 R 4,231,018
4,231,019
347 DA 4,231,020
4,231,022
347 DD 4,231,021
4,231,023
365 S 4,231,024
521 4,231,025
636 4,231,026
4,231,027
644 4,231,028
658 4,231,029
686 4,231,030
695 4,231,031
703 4,231,032
762 4,231,033
765 4,231,034
784 4,231,035

CLASS 343

5 CE 4,231,037
5 DD 4,231,038
5 EM 4,231,036
5 NQ 4,231,005
8 4,231,039
100 SA 4,231,040
767 4,231,041
786 4,231,042
4,231,043
881 4,231,044
882 4,231,045

CLASS 346

75 4,231,046
4,231,047
140 R 4,231,048

CLASS 350

6.5 4,230,393
6.8 4,230,394
96.23 4,230,395
96.31 4,230,396
184 4,230,397
4,230,398

CLASS 354

10 4,230,399
25 4,230,400
4,230,401
33 4,230,402
286 4,230,403
321 4,230,404

CLASS 355

4 4,230,405
15 4,230,406
27 4,230,407
35 4,230,408
55 4,230,409

CLASS 357

13 4,231,049
16 4,231,050
23 4,231,051
24 4,231,052
30 4,231,053
38 4,231,054
42 4,231,055
50 4,231,056
4,231,057
67 4,231,058
68 4,231,059

CLASS 358

69 4,231,060
76 4,231,061
109 4,231,062
148 4,231,063
158 4,231,064
166 4,231,065
180 4,231,066
237 4,231,067
252 4,231,068
256 4,231,069
285 4,231,070

CLASS 360

40 4,231,071
88 4,231,072

CLASS 361

1 4,231,073
44 4,231,074
433 4,231,075
4,231,076

CLASS 362

32 4,231,077
35 4,231,078
106 4,231,079
298 4,231,080
306 4,231,081
368 4,231,082

CLASS 363

135 4,231,083

CLASS 364

200 4,231,084
4,231,085
4,231,086
4,231,087
4,231,088
4,231,089
411 4,231,090
431 4,231,091
4,231,092
460 4,231,093
514 4,231,094
515 4,231,095
523 4,231,096
577 4,231,097
708 4,231,098
718 4,231,099
724 4,231,100
4,231,101
726 4,231,102
4,231,103
900 4,231,104
4,231,105
4,231,106

CLASS 365

87 4,231,107
174 4,231,108
4,231,109
194 4,231,110

CLASS 366

177 4,230,410

CLASS 367

19 4,231,111
158 4,231,112

CLASS 368

282 4,229,936

CLASS 370

24 4,230,903
71 4,230,910
84 4,230,911

CLASS 375

4 4,230,989

CLASS 400

121 4,230,411
124 4,230,412

CLASS 401

65 4,230,413

CLASS 403

95 4,230,414
122 4,230,415
232.1 4,230,416
301 4,230,417

CLASS 405

52 4,230,418
66 4,230,419
166 4,230,420
168 4,230,421
210 4,230,422
211 4,230,423
227 4,230,424
239 4,230,425

CLASS 406

191 4,230,426

CLASS 407

91 4,230,427
116 4,230,428

CLASS 408

186 4,230,429

CLASS 410

59 4,230,430
4,230,431
102 4,230,432

CLASS 414

111 4,230,433
607 4,230,434
722 4,230,435

CLASS 415

1 4,230,436
4,230,437
122 R 4,230,438
138 4,230,439

CLASS 417

424 4,230,440

CLASS 422

33 4,230,663
61 4,230,664
62 4,230,676
64 4,230,665
106 4,230,666
113 4,230,667
140 4,230,668
148 4,230,669
151 4,230,670
159 4,230,671
4,230,672
225 4,230,673
246 4,230,674
272 4,230,675

CLASS 423

54 4,230,677
112 4,230,678
325 4,230,679
360 4,230,680
481 4,230,681
579 4,230,682

CLASS 424

1 4,230,683
4,230,684
12 4,230,685
22 4,230,686
4,230,687
45 4,230,688
74 4,230,689
78 4,230,690
85 4,230,691
122 4,230,692
156 4,230,693
172 4,230,694
177 4,230,695
4,230,696
4,230,697
180 4,230,698
181 4,230,699
204 4,230,700
236 4,230,701
242 4,230,702
244 4,230,703
248.51 4,230,704
250 4,230,705
251 4,230,706
4,230,707
253 4,230,708
256 4,230,709
258 4,230,710
4,230,711
260 4,230,712
263 4,230,713
4,230,714
269 4,230,715
273 R 4,230,716
274 4,230,717
4,230,718
275 4,230,719
278 4,230,720
285 4,230,721
301 4,230,722
302 4,230,723
317 4,230,724
325 4,230,725
4,230,726
330 4,230,727

CLASS 425

87 4,230,441
451.2 4,230,442

CLASS 426

115 4,230,728
124 4,230,729
128 4,230,730
233 4,230,731
393 4,230,732
429 4,230,733
535 4,230,734
557 4,230,735
601 4,230,736
607 4,230,737
656 4,230,738

CLASS 427

42 4,230,739
54.1 4,230,740
67 4,230,741
79 4,230,742
146 4,230,743
163 4,230,744
255.4 4,230,745
373 4,230,746
423 4,230,747
4,230,748
4,230,749
4,230,750
443.1 4,230,751

CLASS 428

17 4,230,752
40 4,230,753
76 4,230,754
95 4,230,755
101 4,230,756
137 4,230,757
141 4,230,758
159 4,230,759
195 4,230,760
215 4,230,761
234 4,230,762
246 4,230,763
268 4,230,764
283 4,230,765
288 4,230,766
307 4,230,808
349 4,230,767
352 4,230,768
412 4,230,769
424.4 4,230,770
437 4,230,771
442 4,230,772
447 4,230,773
518 4,230,774
525 4,230,775
537 4,230,776

CLASS 429

97 4,230,777
104 4,230,778
4,230,780
204 4,230,779

CLASS 430

5 4,230,781
41 4,230,782
42 4,230,783
4,230,784
53 4,230,786
56 4,230,785
107 4,230,787
153 4,230,788
159 4,230,492
4,230,789
288 4,230,790
296 4,230,791
302 4,230,792
315 4,230,793
323 4,230,794
503 4,230,795
523 4,230,796

CLASS 431

6 4,230,444
116 4,230,445
123 4,230,446
158 4,230,447
208 4,230,448
328 4,230,443
353 4,230,449
361 4,230,450

CLASS 432

72 4,230,451

CLASS 433

28 4,230,452
29 4,230,453
153 4,230,454
202 4,230,455

CLASS 435

7 4,230,797
10 4,230,798
76 4,230,799
94 4,230,802
101 4,230,800
4,230,801
176 4,230,803
180 4,230,804
188 4,230,805
255 4,230,806

CLASS 455

29 4,231,113
49 4,231,114
67 4,230,990
73 4,231,115
87 4,231,116

CLASS 474

12 4,229,989
28 4,229,988
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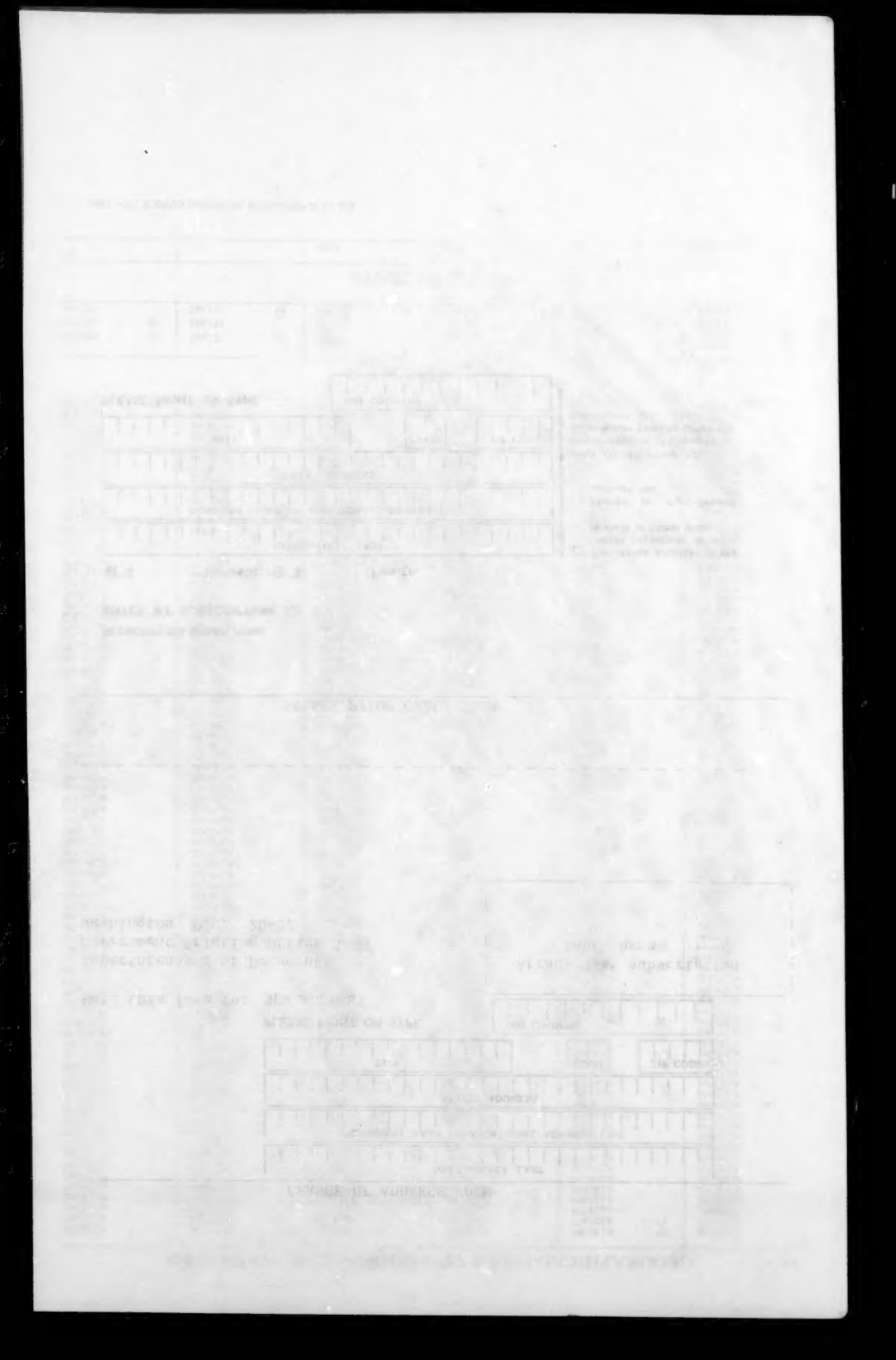

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Philip M. Klutznick, *Secretary*

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